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INTRODUCTION.

This REVIEW is based on reports for December, 1890, from 2,401 regular and voluntary observers. These reports are classified as follows: 171 reports from Signal Service stations; 118 reports from United States Army post surgeons; 1,558 monthly reports from state weather service and voluntary observers; 31 reports from Canadian stations; 184 reports through the Central Pacific Railway Company; 339 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine reports through the "New York Herald Weather Ser-

vice;" monthly reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa Weather and Crop Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Meteorological Report of the Missouri State Board of Agriculture, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, North and South Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Texas, and Wisconsin, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR DECEMBER, 1890.

The month was warmer than the average December, except over the northeast part of the country, and on the middle Pacific coast and the adjoining part of the plateau region. In the British Possessions north of Montana the mean temperature was more than 15° higher, and in the Saint Lawrence Valley and thence southward to the Maine coast it was more than 10° lower than usual. A notable feature of the month was the low temperature which prevailed over the extreme northeast part of the country, where the weather was colder than in any other section within the region of observation. The coldest weather in December commonly occurs in the extreme north-central districts. The severest cold wave of the month extended from Minnesota eastward over the Saint Lawrence Valley on the 2d, when the temperature fell below -25° in parts of Quebec, Ontario, and northwest Minnesota. On the 4th a cold wave prevailed east of the Rocky Mountains. On the 10th a warm wave extended from the Lake region to Missouri and Kansas, and thence to Manitoba. From the 19th to 22d unusually warm weather prevailed in Minnesota and the Dakotas. On the 31st one of the warmest periods on record for the season occurred in Arkansas, east Missouri, and Iowa. The highest temperature reported by a regular station of the Signal Service was 88°, at Brownsville, Tex., and by a voluntary observer, 92°, at Fort Ringgold, Tex. At stations in the middle and west Gulf states and the middle Missouri and Red River of the North valleys the maximum temperature was higher than previously reported for December. The lowest temperature reported by a regular station of the Signal Service was -27°, at Saint Vincent, Minn., and by a voluntary observer, -36°, at Orono, Me. The first killing frost of the season was reported at Monticello, Ga., on the 1st; at Little Rock, Ark., on the 4th; at Palestine, Tex., on the 8th; at Pensacola, Fla., on the 9th; at New Orleans, La., Savannah, Ga., Duke, Fla., and Red Bluff, Cal., on the 10th; at Villa City, Fla., and Charleston, S. C., on the 28th; and at Tampa, Eustis, Jacksonville, and near Titusville, Fla., on 29th.

The precipitation was deficient over a greater part of the country, the only sections in which an excess of precipitation was reported being the Canadian Maritime Provinces, southeast New England, southeast New York, Virginia, east Tennessee, west Pennsylvania, the south part of the southern

plateau, and the extreme north Pacific coast. The greatest excess above the average precipitation for December occurred on the extreme north Pacific coast, where it amounted to 7.60 inches at Neah Bay, Wash., and the excess was more than 4.00 inches at Cape Breton Island. The greatest deficiency occurred in south Alabama and south Mississippi, where it was more than 3.00 inches, and the deficiency was more than 2.00 inches along the Atlantic coast south of the 35th parallel and thence westward over the Gulf States to the 97th meridian, and on the Pacific coast between the 40th and 47th parallels. The monthly precipitation at Pittsburgh, Pa., 5.64 inches, was the heaviest ever reported at that station in December, the greatest amount previously noted for that month being 5.00 inches, in 1879. The least precipitation ever reported for December was noted in North Dakota, Minnesota, west and south Iowa, south Nebraska, and at Walla Walla, Wash. The greatest depth of snowfall, 86 inches, was reported at Blue Knob, Pa. The snowfall exceeded 70 inches along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains; 60 inches in northeast Pennsylvania; 50 inches in central New York; and 40 inches in south-central and southwest Maine, north New Hampshire, north-central Virginia, and southeast Ohio. At the close of the month over 30 inches of snow remained on the ground at points from central New York to southwest Maine, in the mountains of Pennsylvania, and in west-central lower Idaho.

Destructive gales prevailed over the Canadian Maritime Provinces on the 1st; over southeast Massachusetts on the 4th; at New York City on the 12th; at Grand Haven, Mich., on the 13th; on the Atlantic coast from North Carolina to Maine on the 17th, when great damage was caused to shipping and other property by high wind, and to seaside property by high seas; in the Lake region on the 23d, when one person was killed and several injured at Baberton, Ohio, and three persons seriously injured at Detroit, Mich., by falling buildings; on the north Pacific coast and in west Montana on the 25th, when considerable damage was caused to shipping, railroad, and other property; along the middle Atlantic and New England coasts on the 26th, when many disasters to shipping occurred; and in north Texas on the 31st. On the 8th a storm which presented the characteristics of a tornado passed over

Jersey, Walton Co., Ga., killing one person, and damaging buildings to the extent of about \$500. Severe thunder-storms were reported at Pensacola, Fla., on the 3d; in northwest Louisiana on the 5th; and at Dadeville, Mo., on the 31st. Navigation was reported closed for the season on the Great Lakes at Marquette, Mich., on the 3d; at Duluth, Minn., and Green Bay, Wis., on the 4th; at Milwaukee, Wis., on the 5th; at Sandusky, Ohio, on the 6th; at Buffalo, N. Y., and Alpena, Mich., on the 8th; at Cleveland, Ohio, on the 9th; at Oswego, N. Y., on the 13th; and at Port Huron, Mich., on the 25th. Rivers were reported closed by ice as follows: Androscoggin and Penobscot rivers, Me., on the 1st; upper Hudson river on the 3d; Schuylkill River frozen at Philadelphia on the 3d;

Detroit River on the 12th; Connecticut River on the 16th; Monongahela River at Morgantown, W. Va., on the 28th, and at Greensborough, Pa., on the 29th; the Susquehanna River at intervals at Wilkes Barre, Pa. The Mississippi River was frozen over at Red Wing, Minn., on the 2d; Lake Pepin the night of the 2-3d; and the river at Dubuque, Iowa, on the 4th. The Missouri River was closed at Fort Buford, N. Dak., the night of the 3d-4th; and at Fort Yates and Fort Sully, S. Dak., on the 6th. On the 2d water was drawn from the Erie Canal west of Little Falls, N. Y., and on the 18th the Morris Canal, New Jersey, closed for the season. Drought prevailed in parts of Illinois, Missouri, Iowa, Louisiana, Texas, Montana, and Oregon.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for December, 1890, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on chart II by isobars. The departure of the mean pressure for December, 1890, obtained from observations taken twice daily at the hours named, from that determined from hourly observations, varied at the stations named below, as follows:

Station.	Departure.	Station.	Departure.
Duluth, Minn.	+ .001	Saint Louis, Mo.	-.000
Detroit, Mich.	+ .004	Memphis, Tenn.	-.001
Buffalo, N. Y.	+ .003	Cincinnati, Ohio.	-.001
Chicago, Ill.	+ .007	Galveston, Tex.	-.002
Philadelphia, Pa.	+ .007	Denver, Colo.	-.003
New Orleans, La.	+ .006	Fort Assiniboine, Mont.	-.006
Eastport, Me.	+ .009	Salt Lake City, Utah.	-.007
New York City.	+ .010	Santa Fe, N. Mex.	-.010
Washington City.	+ .010	San Francisco, Cal.	-.014
Savannah, Ga.	+ .011	Portland, Oregon.	-.016
Boston, Mass.	+ .015	San Diego, Cal.	-.016

The mean pressure was highest within an area which extended from north Nevada over Utah to west Colorado, where it was 30.25, whence it decreased eastward to below 29.80 at Cape Breton Island, Canadian Maritime Province, southeastward to about 30.20 in the east and west Gulf states, southward and southwestward to below 30.10 over the extreme southwest part of the plateau region and on the south Pacific coast, westward to below 30.15 on the middle Pacific coast, and northwestward and northward to below 29.95 on the extreme north Pacific coast and in the British Possessions north of Washington, Idaho, and west Montana.

A comparison of the pressure chart for December with that of the preceding month shows that there was a general increase in the mean pressure in the east and west Gulf states, the Mississippi, Ohio, and Saint Lawrence valleys, the Lake region, over the southern plateau, and on the middle and south Pacific coasts; elsewhere the mean pressure was lower than for November. The greatest increase in mean pressure occurred in the middle Saint Lawrence valley and northeast Ontario, and over extreme south Florida, where it exceeded .10, and the most marked decrease in mean pressure occurred on the extreme north Pacific coast, where it exceeded .20. The area of high pressure which covered the middle and northern plateau regions in November contracted and in December occupied a part of the middle plateau. Over the Canadian Maritime Provinces, where the mean pressure for November was lowest, there was a decrease of about .10.

The mean pressure was above the normal, except in the Atlantic coast states from Georgia northward, over the northern part of the country from Lake Superior westward to the north Pacific coast, and on the extreme south Pacific coast. The greatest departures above the normal pressure occurred from the east part of the middle plateau region southeastward to the west Gulf coast, where they exceeded .05, and the most marked departures below the normal pressure were noted over east Nova Scotia and Cape Breton Island, where they exceeded

.10. In the British Possessions north of Minnesota, North Dakota, and Montana the departures below the normal pressure exceeded .05.

The monthly barometric ranges at regular stations of the Signal Service are shown in the table of Signal Service data on the last two pages of the REVIEW.

AREAS OF HIGH PRESSURE.

I.—Appeared in Manitoba on the 1st and moved along the extreme northern limit of the United States, reaching the Gulf of Saint Lawrence on the 3d. The temperature fell 10° to 20° over the Northern States on the 1st, and a further fall of 6° to 10° occurred on the 2d.

II.—First appeared north of Montana on the 2d, moved southeastward to Missouri, eastward to Cape Hatteras, and thence southward to northern Florida. A second rise in pressure, following and combining with the increased pressure accompanying number II, produced a high area whose centre was in the Saint Lawrence Valley on the 5th. The temperature fell 10° to 20° in the Ohio and lower Mississippi valleys on the 3d, and 10° in the middle and south Atlantic states on the 4th.

III.—This high area was central in Montana on the 5th, in the Missouri Valley on the 6th, and north of Lake Ontario on the 7th. The pressure on the 5th increased 0.50 inch in Colorado, and the temperature fell 10° to 18° in that state and Arkansas. The area of increased pressure on the 6th included the upper lake region, the upper Mississippi and Missouri valleys, and the southwest. The temperature fell over the same area, the greatest fall being in northern Texas, where it was 15° to 22° on the 7th. There was a fall of 10° in temperature over the Lake region, New England, and the middle Atlantic states. Following the centre of number III was a second centre of high pressure, which formed a part of the same general wave of high barometer that extended from British America to the Gulf of Mexico. On the 7th it caused a further fall of temperature in Texas and Louisiana, and on the 8th a fall of 20° to 30° in the east Gulf states.

IV.—The centre of this high area is traced from British Northwest Territory to Kansas, and thence eastward to North Carolina. Its motion was then to the northwest and it was in Ohio on the 14th, on the 15th in the Saint Lawrence Valley, and on the 16th over Nova Scotia. A fall of 10° to 20° in temperature preceded the centre of the high, reaching the Atlantic coast on the 12th. The southern position of the high on the 13th and 14th, in connection with low area VIII, caused a rise in temperature in the Atlantic coast states on those days. The subsequent movement of the high caused a decided fall of temperature in New England and the middle Atlantic states on the 15th and 16th, the greatest fall being 30° in Vermont on the 16th.

V.—An area of high barometer appeared on the California coast on the 14th. It moved east and southeast to extreme southern Texas, and thence northeast to Cape Hatteras; at this point it united with a high area that started in Manitoba

on the 18th, passed eastward to the Saint Lawrence Valley, and southward to Hatteras, N. C., reaching that point on the 20th. There were no very decided temperature changes, which were irregular, until the appearance of the high in Manitoba on the 18th brought a fall of 20° to 30°, which the next day extended over New England. The lowest temperature was, however, recorded the next day under the influence of the southern position of the high in conjunction with low area number X then central in the Lake region.

VI.—This area was on the California coast on the 20th, in Kansas on the 21st, and over the east Gulf states on the 22d and 23d. The temperature falls were slight, except in New England, when a rise in pressure of 0.40 inch in the Saint Lawrence Valley was coincident with a fall of 10° to 30° in the Maritime Provinces and New England.

VII.—This area followed the extreme northern limit of the United States from British Northwest Territory to the Saint Lawrence Valley and thence to Nova Scotia. The barometer rose nearly 1.00 inch in Manitoba on the 23d, the increase in pressure extending over the lakes, with northwesterly gales and a fall in temperature of 20° to 30°. Similar conditions prevailed over New England on the 24th. The centre of the high remained over Nova Scotia until the 26th when under the influence of low area number XII violent northeast gales prevailed on the New England coast, with velocities ranging from 40 to 68 miles per hour.

VIII.—This area was central in Utah and resulted from a separation of an extended area into two distinct highs, one moving into Kentucky and the other, with increased pressure, extending over Utah and western Colorado. The path of its centre was over the Indian Territory, and Louisiana to Florida, where it was central on the 29th. Killing frost was reported from Pensacola, Fla., on the 28th and 29th, and from Mobile, Ala., on the 29th, and freezing weather was reported at Jacksonville, Fla., during the night of the 28th.

AREAS OF LOW PRESSURE.

I.—Which is a continuation of low area XII of November, was central over Lake Erie on the morning of the 1st and moved during the day southeastward to Virginia. It was accompanied by light snows in the lower lake region and the middle Atlantic states.

II.—This area was central on the Washington coast on the morning of the 1st. It moved southeastward and reached Arkansas on the night of the 2d, where it united with a depression that had developed in Texas on the 1st. The path of the storm after leaving Arkansas was to the northeast over the Lake region and thence to Nova Scotia. Rain fell in Washington on the 1st, and snow in the upper Mississippi and Missouri valleys on the 2d. The area of snowfall extended from the Lakes to New England on the 3d.

III.—This disturbance first appeared on the coast of Washington on the morning of the 3d. The centre moved southeast to New Mexico and thence eastward over the Gulf States to the South Carolina coast, and then followed the coast line to Nova Scotia. The path of this storm is traced for six days, from the 3d to the 9th. Rain fell on the Pacific coast from Washington to southern California on the 3d, and continued on the south Pacific coast on the 4th. Rain fell in Arizona and New Mexico on the 5th, and continued during the 6th. The subsequent precipitation was as follows: rain in the west Gulf states on the 5th, in the east Gulf states on the 6th and 7th, on the south Atlantic coast on the 7th and 8th, and snow in the middle Atlantic states on the 8th.

IV.—This low area appeared central northeast of Lake Superior on the morning of the 6th, separated from low area III, then central in Arkansas, by a low ridge of high barometer. The centre moved southeastward to New York and thence northeast to Nova Scotia, causing rain or snow in the Lake region, the Saint Lawrence Valley, and New England, with high winds on the north Atlantic coast.

V.—The path of this area was beyond the limits of the

United States, and was too far north to have any marked effect on the weather within the limits of the area of observation.

VI.—This area was central in British America north of Montana on the 8th. Its course was southeasterly, passing north of the Lake region to the Saint Lawrence Valley and thence over Nova Scotia. The amount of precipitation reported was small and the areas limited.

VII.—This disturbance appeared as a secondary development following number VI. It was over the Lake region during the night of the 10th and morning of the 11th, and was central near Yarmouth, N. S., on the morning of the 12th. It caused snow and high northwest gales over the lakes and on the New England and middle Atlantic coasts. The study of these two areas (VI and VII) shows the great effect of absolute vapor pressure on the development and movement of storms. It is quite easy to discover in advance of any well-developed storm new centres of development, but number VI is a case in which a decided area of low pressure passed away leaving behind it the conditions necessary for the development of a low with relatively higher pressure but of much greater intensity.

VIII.—Passed from the Pacific coast north of the United States to Lake Superior from the 12th to 14th. It caused rain on the north Pacific coast on the 12th, and high west winds over the lakes on the 13th and 14th.

IX.—This was the most important storm of the month. It was central north of Montana on the morning of the 14th, and moved slowly eastward, and on the night of the 15th was central in Manitoba. At this time the winds had shifted to the northwest in the Missouri Valley, and high northwest winds, with velocities of 30 to 48 miles per hour, prevailed in Montana, Wyoming, North and South Dakota, Nebraska, and Kansas. During the night of the 15th the storm-centre moved to Lake Superior; there was also a secondary development in Illinois, and the area of precipitation extended over the Lake region, the Ohio Valley, and the south Atlantic states. During the 16th the area of low pressure central over the lakes filled up, and the secondary development increased and appeared as the storm-centre on the North Carolina coast; from this point it generally followed the coast line to the northeast. General rain or snow storms prevailed east of the Mississippi River as far south as Georgia on the 16th and 17th, and continued in New England and the middle Atlantic states on the 18th, with high northeast shifting to northwest winds from Cape Hatteras to Nova Scotia.

X.—This low area appeared on the north Pacific coast on the 18th. It moved eastward north of the United States to the Saint Lawrence Valley, and thence to the northeast. It caused light rain in the lower lakes and the Ohio Valley on the 20th, the area of precipitation extending over New England and the middle Atlantic states on the 21st.

XI.—Was central north of Montana on the 21st. In its movement to the eastward it followed closely the path pursued by the preceding storm. There was no appreciable precipitation in advance of the storm. After the centre had reached the Saint Lawrence Valley light snow fell in the Lake region on the 23d, and in New England on the 24th.

XII.—The description of this storm includes the history of two areas, distinct "lows," that moved simultaneously across the United States and finally united in one great storm south of Nova Scotia on the 27th. The a. m. report of the 25th showed two areas of low barometer, one central in Washington and the other in Louisiana. The path of the northern "low" was across the extreme northern part of the United States to the Saint Lawrence Valley, and thence southeastward across New England. The low area central in Texas on the 24th moved eastward to Louisiana and thence over Tennessee to Cape Hatteras; its course was then up the coast until it united with the northern area near Yarmouth, N. S. The rain began in the lower Mississippi valley on the 24th, and continued in the Gulf States on the 25th. Snow fell on this day in the Ohio Valley and Middle States, the snow area extending during the

night and the next day into New England. Heavy gales prevailed on the middle Atlantic and New England coasts, with velocities ranging from 40 to 68 miles per hour. After the two lows united the intensity of the storm increased. The barometer on the morning of the 27th read 29.16 at Yarmouth, N. S. The gales over the lakes and the north Atlantic coast continued until the 28th.

XIII.—The centre of this low area was first located north of Montana. It moved southeastward and was over the Lake region on the 28th, and was accompanied by snow. On the

29th the centre was in the Saint Lawrence Valley and it then passed over Nova Scotia. Snow, with northwest gales, prevailed over the Lake region on the 29th, and on the New England coast on the 28th and 29th.

XIV.—The centre of this low area appeared in Montana on the 29th, was over South Dakota on the 30th, and in Kansas on the 31st. The night map of the last day of the month shows that rain or snow storms prevailed over the entire country east of the Rocky Mountains, and violent northerly gales with snow from North Dakota southward to Kansas.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.		Duration.	Velocity per hour.	Maximum pressure change and maximum abnormal temperature change in twelve hours and maximum wind velocity.											
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.			Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.		
High areas.																			
I.	1	51	100	47	60	2.5	33	Sydney, C. B. I.	.60	3	Halifax, N. S.	27	1	Nantucket, Mass.	nw.	36	2		
II.	2	51	110	31	80	3.0	40	Portland, Me.	.70	4	Nashville, Tenn.	27	3	Block Island, R. I.	nw.	56	4		
III.	5	50	113	47	76	2.5	35	Parry Sound, Ont.	.48	7	Northfield, Vt.	21	8	Nantucket, Mass.	nw.	34	7		
IV.	10	51	115	46	62	6.0	33	Qu'Appelle, N. W. T.	.60	10	Rapid City, S. Dak.	21	13	Block Island, R. I.	nw.	46	12		
V.	14	43	124	35	74	6.0	29	White River, Ont.	.52	18	Toronto, Ont.	22	19	New York City	nw.	44	18		
VI.	15	52	97	35	74	2.5	32	Qu'Appelle, N. W. T.	.50	20	Rockliffe, Ont.	29	22	Saugeen, Ont.	nw.	38	21		
VII.	20	40	124	32	84	3.0	35	Swift Current, N. W. T.	.74	22	Saint Vincent, Minn.	33	22	Grand Haven, Mich.	nw.	52	23		
VIII.	26	58	109	38	84	2.5	28	Saint Vincent, Minn.	.76	26	do	35	26	Fort Sully, S. Dak.	nw.	56	26		
Mean.						3.6	32		.61			27				45			
Low areas.																			
I.	1	42	82	37	77	0.5	33	Norfolk, Va.	.16	1	Chattanooga, Tenn.	23	1	Hatteras, N. C.	sw.	24	1		
II.	1	47	124	45	68	3.0	47	Chatham, N. B.	1.08	4	Chatham, N. B.	41	4	Block Island, R. I.	s.	42	3		
III.	3	48	124	36	74	5.5	32	Red Bluff, Cal.	.46	3	Nashville, Tenn.	23	5	Red Bluff, Cal.	se.	42	3		
IV.	6	48	85	47	59	1.5	42	Chatham, N. B.	.70	7	Halifax, N. S.	19	6	Block Island, R. I.	e.	38	6		
V.	7	53	111	49	87	1.0	42	Port Arthur, Ont.	.46	8	Marquette, Mich.	20	8	Marquette, Mich.	sw.	38	8		
VI.	8	54	110	47	89	3.0	36	Halifax, N. S.	.46	11	Kingston, Ont.	24	9	Northfield, Vt.	s.	30	11		
VII.	11	43	81	44	63	1.5	28	Boston, Mass.	.16	12	Portland, Me.	7	12	New York City	nw.	36	12		
VIII.	12	48	125	49	84	2.5	35	Prince Albert, N. W. T.	.86	13	Minneapolis, Man.	23	13	Marquette, Mich.	w.	30	14		
IX.	14	53	114	47	58	4.5	38	Sydney, C. B. I.	.96	18	Chatham, N. B.	13	18	Block Island, R. I.	ne.	52	17		
X.	18	47	121	46	58	4.0	37	Northfield, Vt.	.42	21	do	27	21	do	sw.	34	21		
XI.	21	51	112	49	61	3.0	35	White River, Ont.	.62	22	do	21	26	Marquette, Mich.	sw.	36	23		
XII.	24	33	104	45	64	3.0	40	Yarmouth, N. S.	1.18	27	Yarmouth, N. S.	27	27	Block Island, R. I.	e.	68	26		
XIII.	25	48	122	44	66	2.0	50	Milwaukee, Wis.	.62	28	Milwaukee, Wis.	28	23	Chicago, Ill.	sw.	48	28		
XIV.	27	53	109	43	64	2.0	50	Wichita, Kans.	.34	31	Concordia, Kans.	15	30	Pueblo, Colo.	w.	34	30		
Mean.						2.6	39		.60			21				42			

NORTH ATLANTIC STORMS FOR DECEMBER, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the depressions that appeared over the north Atlantic Ocean during December, 1890, are shown on chart I. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Among the more notable features of the month were the abnormal southerly course of storms over the eastern part of the ocean, the low pressure which prevailed off the coast of southern Europe during the first two decades of the month, and an unusual prevalence of stormy weather, more especially over the western part of the ocean.

Fifteen storms have been traced for December, 1890, the average number traced for December during the last 7 years being 10.3. The greatest number of storms previously traced for December was 13, in 1887 and 1889, and the least number was 7, in 1884. Of the storms traced for the current month 11 advanced from west of the 60th meridian; one apparently originated east of the Azores; 2 first appeared over mid-ocean between the 50th and 60th parallels; and one moved from high latitudes south of east over or north of the British Isles. 4 storms traversed the ocean from coast to coast.

On the 1st a storm which was central November 30th about midway between Bermuda and the south Atlantic coast was located south of Cape Breton Island in latitude about N. 41°, with pressure falling to about 28.00 (711) and gales of hurricane

force. By the 2d this storm had passed to northeast of Newfoundland, with an appreciable loss of energy, after which it disappeared north of the region of observation. This was the severest storm of the month. At Saint John's, N. F., the gale of the 1st was reported the heaviest in 40 years, and the barometer fell to 28.31 (719) at 11 p. m. The force of the wind was estimated at 70 to 80 miles per hour. Houses, trees, etc., were blown down, and great destruction was caused to shipping off Newfoundland and Nova Scotia, and in the Gulf of Saint Lawrence. On the 1st a storm of considerable strength was central south of Iceland, whence it apparently moved south of east over or north of Scotland. On the 2d a storm was central west of the Spanish Peninsula, whence it moved slowly northeastward to the Bay of Biscay, where it was central on the 5th and 6th, after which its course cannot be traced with reports at hand. On the morning of the 4th a storm of considerable strength was central in New England, whence it passed northeastward over Newfoundland beyond the region of observation, attended by very severe gales over Nova Scotia and Cape Breton Island. On the morning of the 7th a storm was central over Nova Scotia, whence it moved to the northeast of Newfoundland by the 8th, with heavy gales, and pressure falling to 28.72 (729) at Saint John's, N. F., at 7 a. m. of the 8th. By the 9th the storm-centre had advanced northeastward to the 40th meridian, without an appreciable loss of energy, after which it moved east and south of east and disappeared over the Bay of Biscay after the 11th. During

the 7th and 8th a storm of moderate strength moved north of east from mid-ocean in high latitudes and disappeared beyond the region of observation after the 8th. On the 9th a storm which had apparently advanced from northwest of Bermuda was central between Bermuda and the Grand Banks, whence it moved to south of the Grand Banks by the 10th, after which it recurved northward over the east edge of the Grand Banks, and after the 11th united with a depression which had advanced from Nova Scotia during the 11th and morning of the 12th. By the 13th this storm had moved rapidly north of east to the 25th meridian, after which it disappeared beyond the region of observation. On the 14th and 15th a disturbance occupied the ocean west of the Bay of Biscay and the Spanish Peninsula. On the morning of the 12th a storm of considerable strength was central south of Nova Scotia, whence it moved to north Newfoundland by the 13th, and north of east to the 40th meridian by the 14th, after which it passed south of east, and apparently disappeared over the Bay of Biscay after the 15th. On the evening of the 16th a storm appeared off the south Atlantic coast, to which position it had apparently advanced from the southeast. During the 17th this storm moved northward along the south and middle Atlantic coasts, and on the morning of the 18th was central southwest of Nova Scotia, with pressure below 29.30 (744). By the morning of the 19th the storm was central over north Newfoundland, with pressure below 28.80 (731), whence it moved northeastward to the 50th meridian by the 20th, without an appreciable loss of energy. By the 21st the storm had moved north of east to about the 33d meridian, after which it disappeared north of the region of observation. On the 16th a storm appeared over mid-ocean, and moved southeastward to the 50th parallel in about W. 23° by the 17th, and by the 19th was apparently central west of Ireland, where pressure 29.20 (742) was reported. The storm apparently remained in that region during the 19th, after which it disappeared beyond the region of observation, having apparently passed southeast of the British Isles. On the 23d a storm was central northeast of Newfoundland, to which position it had advanced from the Gulf of Saint Lawrence. By the 24th the storm had moved rapidly eastward to about the 25th meridian, after which it recurved to the northward and disappeared north of the region of observation. This storm was apparently deflected to the northward by high

pressure over and south of the British Isles. On the 24th a storm was central north of Newfoundland, having advanced from the Saint Lawrence Valley, whence it moved east and south of east to about the 23d meridian by the 27th, after which it apparently recurved northward under the influence of high pressure to the eastward. On the morning of the 27th a storm was central off the New England coast, to which position it had advanced from the middle Atlantic coast, whence it moved northeast over the Gulf of Saint Lawrence by the 28th, after which date it disappeared north of the region of observation. This storm exhibited marked energy on the 27th and 28th. On the morning of the 30th a storm was central south of Newfoundland, having advanced eastward over New England and Nova Scotia, and by the morning of the 31st the storm-centre had moved to northeast of Newfoundland, where a moderate display of energy was shown.

OCEAN ICE IN DECEMBER.

The only Arctic ice reported was a large iceberg in N. 49° 39', W. 47° 50', on the 13th. The Strait of Canso was reported full of ice on the 27th. In December, 1882, 1883, 1884, 1886, and 1888, no Arctic ice was reported near Newfoundland and the Grand Banks. In 1885 several icebergs were observed off the Newfoundland coast the latter part of the month. In 1887 a small iceberg was reported in N. 46° 10', W. 47° 28' on the 26th, and a small iceberg in N. 48° 20', W. 48° 40' on the 28th.

FOG IN DECEMBER.

The limits of fog-areas west of the 40th meridian, as determined by reports of shipmasters, are shown on chart I by dotted shading. East of the 55th meridian fog was reported on 3 dates. No fog was reported west of the 55th meridian. Compared with the corresponding month of the last 3 years the dates of occurrence of fog near the Grand Banks in December, 1890, was 2 less than the average. The average number of foggy days between the 55th and 65th meridians in December, as shown by reports of the last 3 years is 4, and west of the 65th meridian the average number is 3. On the dates fog was reported near the Grand Banks for the current month, the 11th, 28th, and 29th, it occurred with the approach of general storms from the westward. On the 3d, 6th, 17th, and 26th, dense fog was reported at points along the New England, New York, and New Jersey coasts with the approach of general storms.

TEMPERATURE OF THE AIR (expressed in degrees, Fahrenheit).

Many of the voluntary stations do not have standard thermometers or shelters.

The distribution of mean temperature over the United States and Canada for December, 1890, is exhibited on chart II by dotted isotherms. In the table of Signal Service data the monthly mean temperature and the departure from the normal are given for regular stations of the Signal Service. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the departure is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Signal Service represents the mean of the maximum and minimum temperatures.

The mean temperature was highest in extreme south Florida, where it was above 65, and the mean values were above 60 over the southern half of the Florida Peninsula, in the lower Rio Grande valley, and in extreme south California and southwest Arizona. The mean temperature was lowest in north New England and the Saint Lawrence Valley, where it was below 10, and the mean readings were below 20 north of a line traced from extreme south New Hampshire westward to northeast Pennsylvania, thence northward over central New York, and thence west-northwest over south Manitoba. The

mean temperature was also below 20 at stations in central Idaho and Wyoming.

The mean temperature was above the normal, except from the east part of the upper lake region eastward and southward to the Atlantic coast, and on the middle Pacific coast and the west part of the middle plateau region. The greatest departure above the normal temperature occurred in the British Possessions north of Montana, where it was more than 15, and the departure above the normal exceeded 5 over the northern part of the country between the 87th and 120th meridians, and thence to north Texas. The departure above the normal also exceeded 5 on the extreme south Pacific coast and in southwest Arizona. The most marked departure below the normal temperature occurred in the Saint Lawrence Valley and thence southward to the west Maine coast, where it exceeded 10, and the departure below the normal exceeded 5 generally in New York, New England, and the Canadian Maritime Provinces.

A notable feature of the distribution of temperature for the month was the cool weather which prevailed over the northeast part of the country, and the unusual warmth of the season in the north-central districts. At Montreal, Quebec, where the normal temperature for December is 14 above that of Saint Vincent, Minn., and 5 above that of Bismarck, N. Dak., the mean temperature for the current month was 12 and 18 below

that of the stations named, respectively; and at Eastport, Me., where the normal temperature is 21 above that of Saint Vincent, Minn., and 12 above that of Bismarck, N. Dak., the mean temperature for the current month was 1 and 7 below that of the stations named, respectively.

The following are the more important general temperature changes of the month:

On the 2d a severe cold wave extended from Minnesota eastward over the Saint Lawrence Valley, the minimum temperature falling below -25 in parts of Quebec, Ontario, and in northwest Minnesota, to -8 at Eastport, Me., Northfield, Vt., and Sault de Ste. Marie, Mich., and to -6 at Duluth, Minn. On the 4th unusually cold weather prevailed east of the Rocky Mountains, the temperature in Wisconsin, north Illinois, and northeast Iowa being more than 20 below the average for the season. A report from Quebec, Quebec, dated the 8th, stated that an ice bridge had formed over the Saint Lawrence River, and that this was the earliest date on record for the formation of an ice bridge at that point. On the 10th a warm wave extended from the Lake region southwest to Missouri and Kansas, and thence northward to Manitoba, the temperature in the Dakotas and Manitoba being 20 to 30 above the average for the season. From the 19th to the 22d unusually warm weather prevailed in Minnesota and the Dakotas, the temperature ranging 20 to 30 above the average for the season. On the 22d the temperature in west Wisconsin, east Minnesota, Wyoming, and Montana was 20 above, and in the Dakotas 30 to 40 above the average for the season. In north Minnesota the high temperature was unprecedented, and was 5 to 10 higher than ever before recorded for the season. On the 31st the temperature was 25 to 30 above the average in Arkansas, east Missouri, and Iowa, and the month closed with one of the warmest periods on record for the season in that region.

The warmest December in the history of the Signal Service occurred from Nevada and Arizona eastward to the Atlantic coast from Massachusetts to north Florida in 1889, when the mean temperature was 5 to 9 above the normal in the plateau region, 10 to 15 above on the middle-eastern and southeast slopes of the Rocky Mountains and in the west Gulf states, 13 to 18 above in the middle and lower Mississippi and lower Missouri valleys, 9 to 10 above in the east Gulf states, 13 to 16 above in the Ohio Valley and Tennessee, 9 to 12 above in the lower lake region, and 7 to 10 above in the south and middle Atlantic states and south New England; on the north Pacific coast, in the Sacramento Valley, and the west parts of the middle and northern plateau regions in 1886, when the mean temperature was 2 to 7 above the normal; in the upper Missouri valley and on the Pacific coast from San Francisco to Los Angeles, Cal., in 1885, when the mean temperature was 13 above the normal in the upper Missouri valley, and 2 to 3 above on the Pacific coast; in the Dakotas and Red River of the North Valley, and from Lake Ontario eastward over north New York and north New England in 1881, when the mean temperature was 10 to 12 above the normal in the Dakotas and 6 to 10 above in north New York and north New England; over the Florida Peninsula in 1879, when the mean temperature was 4 to 6 above the normal; and in the upper lake region and along the Mississippi River north of the 40th parallel in 1877, when the mean temperature was 10 to 17 above the normal.

The coolest December in the history of the Signal Service was generally noted east of the lower Missouri valley and the southeast slope of the Rocky Mountains in 1876, when the mean temperature was 6 to 8 below the normal in the west Gulf states, 9 to 15 below in the middle and upper Mississippi valleys, 7 to 9 below in the east Gulf states, 9 to 12 below in the Ohio Valley and Tennessee, 6 to 12 below in the south and middle Atlantic states and New England, and 7 to 10 below in the lower lake region; from the north Pacific coast and the northern plateau region southeast over the lower Missouri Valley in 1884, when the mean temperature was 6 to 10 below the normal on the north Pacific coast, 16 to 17 below in the northern plateau region and on the northeast slope of the Rocky

Mountains, and 9 to 12 below on the middle-eastern slope of the Rocky Mountains and in the lower Missouri valley; in the middle Missouri valley and over a greater part of California south of the 40th parallel in 1879, when the mean temperature was 14 to 15 below the normal in the middle Missouri valley, and about 3 below in California; and at stations in the central upper lake region in 1872, when the mean temperature was 9 to 10 below the normal.

In 1889, when the mean temperature was the highest ever reported for December over a greater part of the country south of the 45th parallel and east of the 115th meridian, an area of high pressure occupied the southeastern states, where the mean pressure was about one-tenth of an inch above the normal; no general storm traversed the country east of the Mississippi River and south of the 40th parallel; and there was an unusual prevalence of general storms over and north of the Lake region.

In 1876, when the mean temperature was the lowest ever reported for December over the country east of the Mississippi River, an area of unusually high pressure extended over and west of the lower Mississippi valley; a similar area occupied the eastern Dakotas; and three well-defined and energetic general storms traversed the Gulf States.

DEVIATIONS FROM NORMAL TEMPERATURE.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for December for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for December, 1890; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for December, during the period of observation and the years of occurrence:

State and station.	County.	(1) Normal for the month of Dec.	(2) Length of record.	(3) Mean for Dec., 1890.	(4) Departure from normal.	(5) Extreme monthly mean for Dec.			
						Highest.	Year.	Lowest.	Year.
<i>Arkansas.</i>									
Lead Hill	Boone	39.1	9	41.7	+ 2.6	55.3	1889	29.1	1884
<i>California.</i>									
Sacramento	Sacramento	46.9	36	39.9	- 7.0	50.9	1861	39.9	1890
<i>Connecticut.</i>									
Middletown	Middlesex	28.8	22	24.7	- 4.1	36.0	1889	21.8	1872
<i>Florida.</i>									
Merritt's Island	Brevard	62.8	8	61.2	- 1.6	67.0	1883	58.0	1885
<i>Georgia.</i>									
Forsyth	Monroe	49.7	16	51.6	+ 1.9	61.3	1889	39.8	1876
<i>Illinois.</i>									
Peoria	Peoria	29.2	35	33.8	+ 4.6	44.3	1877	18.5	1876
Riley	McHenry	22.8	34	25.6	+ 2.8	37.7	1877	11.1	1876
<i>Indiana.</i>									
Vevay	Switzerland	34.9	25	35.9	+ 1.0	49.0	1889	24.6	1876
<i>Iowa.</i>									
Cresco	Howard	17.1	19	22.3	+ 5.2	34.0	1877	4.5	1876
Monticello	Monticello	21.7	36	26.0	+ 4.3	39.5	1877	8.1	1859
Logan	Harrison	25.5	16	33.8	+ 8.3	39.6	1889	15.4	1879
<i>Kansas.</i>									
Lawrence	Douglas	30.5	23	36.0	+ 5.5	44.8	1889	19.8	1872
Wellington	Sumner	32.8	11	39.0	+ 6.2	46.2	1889	23.1	1884
<i>Louisiana.</i>									
Grand Coteau	Saint Landry	56.3	8	56.5	+ 0.2	65.0	1889	51.8	1887
<i>Maine.</i>									
Orono	Penobscot	21.3	20	11.4	- 9.9	30.8	1881	11.4	1890
<i>Maryland.</i>									
Cumberland	Allegany	31.9	31	31.8	- 0.1	43.2	1889	24.8	1866
<i>Massachusetts.</i>									
Amherst	Hampshire	33.8	44	23.9	- 9.9	36.0	1881	19.5	1872
Newburyport	Essex	30.8	12	23.4	- 7.4	36.5	1881	23.4	1890
Somerset	Bristol	30.7	18	28.1	- 2.6	39.0	1889	21.8	1876
<i>Michigan.</i>									
Kalamazoo	Kalamazoo	29.4	14	29.1	- 0.3	40.2	1889	16.7	1876
Thornville	Lapeer	27.8	13	26.8	- 1.0	38.0	1889	19.6	1886
<i>Minnesota.</i>									
Minneapolis	Hennepin	15.2	26	23.3	+ 8.1	31.6	1877	1.9	1872
<i>Montana.</i>									
Fort Shaw	Lewis & Clarke	25.3	22	36.2	+ 10.9	39.7	1875	2.2	1884
<i>New Hampshire.</i>									
Hanover	Grafton	20.8	52	12.4	- 8.4	31.2	1847	10.2	1872
<i>New Jersey.</i>									
Moorestown	Burlington	32.5	27	30.3	- 2.2	41.0	1889	23.9	1876
South Orange	Essex	32.0	20	27.9	- 4.1	38.6	1889	24.3	1872
<i>New York.</i>									
Cooperstown	Otsego	27.3	36	18.4	- 8.9	33.1	1881	14.7	1876
Palermo	Oswego	24.9	36	19.5	- 5.4	33.7	1889	16.8	1880
<i>North Carolina.</i>									
Lenoir	Caldwell	38.2	18	38.9	+ 0.7	48.9	1889	29.1	1876
<i>Ohio.</i>									
N'th Lewisburgh	Champaign	30.1	58	30.4	+ 0.3	44.3	1889	19.0	1876
Wauseon	Fulton	27.2	20	27.7	+ 0.5	38.8	1877, '89	17.1	1872

Deviations from normal temperature—Continued.

State and station.	County.	(1) Normal for the month of Dec.	(2) Length of record.	(3) Mean for Dec., 1890.	(4) Departure from normal.	(5) Extreme monthly mean for Dec.			
						Highest.	Year.	Lowest.	Year.
<i>Oregon.</i>									
Albany	Linn	41.5	11	43.2	+ 1.7	49.5	1886	33.1	1884
Eola	Polk	39.9	19	41.2	+ 1.3	47.0	1886, '87	30.7	1884
<i>Pennsylvania.</i>									
Dyberry	Wayne	25.5	23	20.6	- 4.9	33.3	1889	17.3	1876
Grampian Hills ..	Clearfield ..	25.7	26	24.0	- 1.7	37.0	1877	16.0	1876
Wellaborough ..	Tioga	30.2	11	22.2	- 8.0	39.5	1881	22.2	1890
<i>South Carolina.</i>									
Statesburgh	Sumter	47.7	9	46.8	- 0.9	56.6	1889	43.6	1882
<i>Tennessee.</i>									
Austin	Wilson	40.7	20	41.8	+ 1.1	56.5	1889	25.0	1876
<i>Texas.</i>									
New Ulm	Austin	54.3	17	56.1	+ 1.8	65.8	1889	46.1	1876
<i>Vermont.</i>									
Stratford	Orange	23.1	17	13.4	- 8.7	29.5	1881	13.4	1890
<i>Virginia.</i>									
Birdnest	Northampton	41.5	22	41.0	- 0.5	51.1	1879	32.7	1876
<i>Washington.</i>									
Fort Townsend ..	Jefferson	41.0	15	44.8	+ 3.8	45.3	1885	33.0	1884
<i>Wisconsin.</i>									
Madison	Dane	22.7	21	26.3	+ 3.6	38.7	1877	11.7	1876

MAXIMUM AND MINIMUM TEMPERATURES.

The highest temperature reported by a regular station of the Signal Service was 88, at Brownsville, Tex., on the 5th. The maximum temperature rose above 80 over the Florida Peninsula, in south and east-central Texas, and at Los Angeles, Cal., and was above 70 south of a line traced from the Atlantic coast in latitude about 34° westward to the Mississippi River, thence northwestward to extreme southwest South Dakota, and east of this line continued southward to west Texas. The maximum temperature was also above 70 over south California, extreme south Nevada, and west Arizona. The maximum temperature was lowest in New England north of Massachusetts, generally over New York, the Lake region, and Minnesota, and at stations in the middle and northern plateau regions, where it was below 50. At stations in the middle and west Gulf states and the middle Missouri and Red River of the North valleys the maximum temperature was higher than previously reported for December, the excess above the highest maximum temperature previously reported for December varying from 1 to 4 in east Texas, from 2 to 4 in the middle Missouri valley, and amounting to 8 at Saint Vincent, Minn. The reports of United States Army post surgeons and voluntary observers show the following maximum temperatures in states and territories where temperature rising to or above 80 was reported: Fort Ringgold, Tex., 92; Gila Bend (2), Ariz., 88; Alva, Fla., 86; several stations in Louisiana, 82; Vaiden, Miss., 81; Citronelle, Ala., and Blakely, Ga., 80.

The lowest temperature reported by a regular station of the Signal Service was -27, at Saint Vincent, Minn., on the 2d. The minimum temperature fell below zero in New England from Massachusetts northward, in northeast New York, in the extreme north part of the upper lake region, and north of a line traced from north Wisconsin southwestward to west-central Iowa, and thence northwestward to northwest Montana. The minimum temperature was highest over extreme south Florida, where it was above 50, and the minimum values were above 40 over south Florida, extreme south Louisiana, along the south Pacific coast, and in extreme south Nevada. The reports of United States Army post surgeons and voluntary observers show the following minimum temperatures in states

and territories where temperature falling to or below zero was reported: Orono, Me., -36; East Berkshire, Vt., -34; Berlin Falls, N. H., -31; Fort Pembina, N. Dak., -29; Pokegama Falls, Minn., -24; Woonsocket, S. Dak., and Breckenridge, Colo., -21; Fort Keogh, Mont., -19; West Bend, Iowa, and Madison Barracks, N. Y., -18; Hillman, Mich., -17; Hayward, Wis., -16; Saratoga, Wyo., -14; Troy, Pa., -13; Monson, Mass., and Fort Niobrara, Nebr., -10; Bonanza, Idaho, -9; Southington, Conn., -5; Garrettsville, Ohio, -4; Lakin, Kans., and Cassville, Mo., -3; Chama and Monero, N. Mex., and several stations in Illinois, -2; Alta, Utah, and Burns, Oregon, zero.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on chart IV by a line traced from the Florida coast south of Jacksonville southwestward to the west Florida coast south of Tampa, and a second line traced just inside the west Gulf coast. The western limit of freezing weather is shown on this chart by a line traced from the lower Gila valley, Arizona, west of north to extreme south Nevada, thence westward to west-central California, thence west of north along the San Joaquin and Sacramento valleys to extreme northwest California, thence along the coast line to the mouth of the Columbia River, and thence northward inside the coast line over west Washington.

RANGES OF TEMPERATURE.

The greatest and least daily ranges of temperature are given in the table of Signal Service data. The greatest monthly ranges of temperature occurred in the middle Missouri and Red River of the North valleys, where they exceeded 70, whence they decreased eastward to less than 40 from the lower lake region southward to east Tennessee and the middle Atlantic coast, and thence increased to more than 60 in north New England. From the middle Missouri valley the monthly ranges decreased southeastward to less than 30 over extreme south Florida, southward to less than 40 on the middle Texas coast, southwestward to less than 40 over south Arizona, and westward to less than 30 on the middle Pacific coast, and to less than 20 in extreme northwest Washington.

FROST.

The first black frost of the season was reported at Shreveport, La., on the 9th, and at New Orleans, La., on the 10th. The first killing frost of the season was reported as follows: 1st, Monticello, Ga.; 4th, Little Rock, Ark.; 8th, Palestine, Tex.; 9th, Pensacola, Fla.; 10th, Savannah, Ga., Duke, Fla., and Red Bluff, Cal.; 28th, Villa City, Fla., and Charleston, S. C.; 29th, Tampa, Eustis, Jacksonville, and Titusville (1 mile from), Fla. Compared with the average date of first killing frost in the several localities the killing frost of the 10th at New Orleans, La., was about 1 week late; that of the 4th at Little Rock, Ark., and of the 29th at Titusville, Fla., was about 2 weeks late; that of the 9th at Pensacola, Fla., and of the 29th at Tampa, Fla., was about 3 weeks late; that of the 10th at Savannah, Ga., and of the 29th at Jacksonville, Fla., was about 4 weeks late; that of the 8th at Palestine, Tex., was about 5 weeks late; and that of the 28th at Charleston, S. C., was about 2 months late. Light frost occurred as far south as Lee county, Fla., on the 10th, 19th, 29th, and 30th; to extreme south Alabama and Mississippi on the 1st, 9th, 10th, 18th, 19th, and 27th to 29th; in east Texas to the 29th parallel on the 8th to 10th, 17th, 18th, and 26th; in southwest New Mexico and southeast Arizona on a number of dates; and in California to Los Angeles on the 6th, 9th, and 31st.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for December, 1890, as determined from the reports of nearly 2,000 stations, is exhibited on chart III. In the table of Signal Service data the total precipitation and the depart-

ure from the normal are given for each Signal Service station. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts.

The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

The heaviest precipitation occurred on the north Pacific coast, where 22.00 fell at Neah Bay, Wash. The monthly precipitation exceeded 8.00 in extreme northwest California, and at Cape Breton Island; it exceeded 6.00 along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains in California, on the North Carolina, Virginia, Maine, and Nova Scotia coasts; and was more than 4.00 in central Arizona, in an area extending from north Louisiana to west Pennsylvania and central New York, on the north New Jersey and New York coasts, and generally along the New England coast and in south New Hampshire and Vermont. No precipitation was reported at stations in east Colorado and the adjoining part of northwest Kansas. The monthly precipitation was less than 0.25 from Wyoming and Colorado eastward in a narrowing area to west Indiana, from northeast Montana east-southeast over north Minnesota, and from central New Mexico to west Indian Territory, and it was less than 1.00 over a greater part of the Rocky Mountain and plateau regions, in north Texas, the upper Mississippi and Missouri valleys, south Florida, and from the northwest part of the upper lake region to central lower Michigan.

The precipitation was in excess of the December average in the Canadian Maritime Provinces, at southeast New England and southeast New York stations, in Virginia, east Tennessee, and southwest Pennsylvania, over the south part of the southern plateau, and on the extreme north Pacific coast. In all other districts, which include nearly the entire country, the precipitation was deficient. The greatest excess in precipitation occurred on the extreme north Pacific coast, where it amounted to 7.60 at Neah Bay, Wash., and the excess above the normal was more than 4.00 at Cape Breton Island. The greatest deficiency occurred in south Alabama and south Mississippi, where it was more than 3.00, and the deficiency was more than 2.00 on the Atlantic coast south of the 35th parallel, and thence westward over the Gulf States to the 97th meridian, and on the Pacific coast between the 40th and 47th parallels.

Considered by districts the average percentage of the normal in districts where the precipitation was in excess was about as follows: southern plateau, 122 per cent.; middle Atlantic states, 115 per cent.; New England, 103 per cent. In districts where the precipitation was deficient the percentage of the normal was about as follows: middle-eastern slope of the Rocky Mountains, 13 per cent.; lower Rio Grande valley, 15 per cent.; Key West, Fla., 18 per cent.; upper Mississippi valley, 34 per cent.; extreme northwest, 36 per cent.; northern plateau, 39 per cent.; east Gulf states, 41 per cent.; northeast slope of the Rocky Mountains and lower lakes, 43 per cent.; Missouri Valley, 44 per cent.; upper lakes, 51 per cent.; west Gulf states, 52 per cent.; south Atlantic states, 55 per cent.; middle plateau, 67 per cent.; middle Pacific coast, 71 per cent.; south Pacific coast, 70 per cent.; southeast slope of Rocky Mountains, 81 per cent.; Ohio Valley and Tennessee, 89 per cent.; and north Pacific coast, 97 per cent.

For the year 1890 the precipitation averaged nearly the normal in New England, the middle Atlantic states, at Key West, Fla., in the west Gulf states, the extreme northwest, on the southeast slope of the Rocky Mountains, over the southern plateau, and on the middle Pacific coast. It averaged one-tenth to two-tenths in excess of the normal in the Ohio Valley and Tennessee and the lower lake region. It averaged two-thirds to three-fourths of the normal in all other districts, save in the upper lake region, the upper Mississippi and Missouri valleys, and on the north Pacific coast, where eight-tenths to nine-tenths of the normal amount was reported.

The heaviest precipitation ever reported for December was noted at Pittsburgh, Pa., in 1890, when the excess above the normal was 2.89, and the precipitation was 0.64 greater than previously reported for December. The heaviest precipitation for December occurred from the middle Missouri valley south-

ward over the middle slope of the Rocky Mountains to the Rio Grande Valley, and on the North Carolina coast in 1877, when the excess was 2.00 to 5.00 from the middle Missouri valley to the Rio Grande Valley, and 3.00 to 7.00 on the North Carolina coast; over north New York and middle and east-central New England in 1878, when the excess was 3.00 to 7.00; from the middle Ohio valley southward over east Kentucky, east Tennessee, and north Georgia in 1879, when the excess was 2.00 to 5.00; in the upper Missouri and Sacramento valleys in 1880, when the excess was 1.00 to 3.00 in north Montana, and 7.00 to 8.00 in the Sacramento Valley; in Alabama in 1881, when the excess was 4.00 to 5.00; from south Montana and west North Dakota southward over Wyoming and central Colorado in 1883, when the excess was 0.50 to 1.50; from east Texas and north Louisiana northeastward over the middle Mississippi and lower Ohio valleys and Michigan, over the southeast part of the southern plateau region, and in southeast New York, north New Jersey, and Connecticut in 1884, when the excess was 3.00 to 12.00 in Louisiana and Arkansas, 2.00 to 5.00 in the middle Mississippi and lower Ohio valleys, 3.00 to 6.00 in Michigan, about 3.00 in southeast New York and Connecticut, and 1.50 to 3.00 in east Arizona; on the coast of Washington in 1886, when the excess was 6.00 to 14.00; on the South Carolina coast in 1887, when the excess was about 4.00; generally over the plateau region and on the south Pacific coast in 1889, when the excess was 1.00 to 3.00 over the plateau region, and 5.00 to 12.00 on the south Pacific coast.

The least precipitation ever reported for December occurred in north North Dakota, Minnesota, west and south Iowa, and south Nebraska, at Walla Walla, Wash., and at stations in Indiana, Louisiana, and Michigan in 1890, when the deficiency below the normal was 0.30 to 0.75 in north North Dakota and northwest Minnesota, over 1.00 in southeast Minnesota, about 1.00 in Iowa and south Nebraska, and about 2.00 at Walla Walla, Wash.; at Lake Michigan stations in 1872, when the deficiency was about 2.00; in the lower lake region and at Lake Huron stations in 1874, when the deficiency was about 2.00; in south New England, southeast New York, New Jersey, and east Pennsylvania in 1877, when the deficiency was about 2.00; in the Ohio Valley, north Tennessee, and at stations in the middle Mississippi valley in 1876, when the deficiency was 1.50 to 3.50; in the Sacramento Valley in 1883, when the deficiency was 3.00 to 4.00; at stations in the southern plateau region and in extreme south California in 1886, when the deficiency was about 2.00 at San Diego, Cal., and Fort Apache, Ariz., and 0.42 at Keeler, Cal.; and from the southern plateau region eastward over the Gulf States and in the Atlantic coast states south of the 40th parallel in 1889, when the deficiency was 3.00 to 4.00 in the Atlantic coast and east and west Gulf states, and 1.00 to 2.00 in the lower Rio Grande valley.

In 1877, when the precipitation was the heaviest ever reported for December on the North Carolina coast and from the middle Missouri valley south to the Rio Grande valley, it was the least ever noted for that month in south New England, southeast New York, New Jersey, and east Pennsylvania. In 1883, when it was the heaviest on record from Montana southward over central Colorado, it was the least ever noted in the Sacramento Valley. In 1886, when it was the heaviest on the coast of Washington, it was the least over the southern plateau and extreme south California. In 1889, when it was the heaviest ever reported generally over the plateau region and on the south Pacific coast, it was the least recorded for that month over the southeastern part of the country. In 1890, when the precipitation was the heaviest ever reported for December in west Pennsylvania, it was the least noted for that month from the Red River of the North Valley southward over Iowa, and thence westward over south Nebraska.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for December for a series of years; (2) the length of record during

which the observations have been taken and from which the average has been computed; (3) the total precipitation for December, 1890; (4) the departure of the current month from the average; (5) and the extremes for December during the period of observation and the years of occurrence:

State and station.	County.	(1) Average for the month of Dec.	(2) Length of record.	(3) Total for Dec., 1890.	(4) Departure from average.	(5) Extremes for Dec.			
						Greatest.		Least.	
						Am't.	Year.	Am't.	Year.
Arkansas.		Inches	Years	Inches	Inches	Inches		Inches	
Lead Hill.....	Boone.....	3.62	9	2.15	-1.47	11.37	1884	1.15	1889
California.									
Sacramento.....	Sacramento	4.70	40	3.72	-0.98	13.41	1852	0.00	'50, '76
Connecticut.									
Middletown.....	Middlesex...	3.75	30	4.46	+0.71	7.91	1878	1.20	1875
Florida.									
Merritt's Island.	Brevard.....	2.47	12	3.15	+0.68	8.55	1888	0.00	1889
Georgia.									
Forsyth.....	Monroe.....	4.51	16	3.88	-1.63	7.56	1887	0.70	1889
Illinois.									
Peoria.....	Peoria.....	2.44	35	0.41	-2.03	7.15	1873	0.28	1876
Riley.....	McHenry.....	2.05	39	1.13	-0.92	5.67	1876	0.28	1857
Indiana.									
Logansport.....	Cass.....	3.37	14	0.46	-2.91	5.99	1881	0.46	1890
Vevay.....	Switzerland..	3.87	25	3.03	-0.84	7.60	1879	1.16	1888
Iowa.									
Cresco.....	Howard.....	1.37	19	0.44	-0.93	2.83	1879	0.30	1874
Monticello.....	Jones.....	2.40	35	0.71	-1.69	6.99	1856	0.65	1867
Logan.....	Harrison.....	1.37	20	.....	.....	3.10	1868	0.14	1889
Kansas.									
Lawrence.....	Douglas.....	1.65	26	1.00	-0.65	4.39	1873	0.08	1889
Wellington.....	Sumner.....	0.98	11	0.79	-0.19	3.14	1884	T.	1889
Louisiana.									
Grand Coteau...	St. Landry..	5.82	7	2.27	-3.55	14.43	1884	2.27	1890
Maine.									
Orono.....	Penobscot...	3.94	20	4.10	+0.16	7.92	1878	1.50	1875
Maryland.									
Cumberland.....	Allegany.....	2.11	19	3.77	+1.66	4.50	1881	0.70	1870
Massachusetts.									
Amherst.....	Hampshire..	3.56	55	3.15	-0.41	7.09	1839	0.96	1838
Newburyport.....	Essex.....	3.86	12	5.51	+1.65	5.80	1886	2.45	1880
Somerset.....	Bristol.....	3.44	18	4.17	+0.73	5.67	1884	0.82	1875
Michigan.									
Kalamazoo.....	Kalamazoo..	3.01	14	1.35	-1.66	7.14	1884	1.35	1890
Thornville.....	Lapeer.....	2.53	13	1.43	-1.10	5.25	1879	0.67	1880
Minnesota.									
Minneapolis.....	Hennepin....	1.57	23	0.50	-1.07	5.30	1873	0.33	1866
Montana.									
Fort Shaw.....	LewisClarke	0.52	20	0.47	-0.05	2.47	1884	0.00	'75, '77
New Hampshire.									
Hanover.....	Grafton.....	2.52	48	4.66	+2.14	5.05	1839	0.78	1875
New Jersey.									
Moorestown.....	Burlington..	3.13	27	3.99	-0.14	5.77	1865	0.90	1877
South Orange.....	Essex.....	3.82	20	4.08	+0.26	7.07	1878	0.91	1877
New York.									
Cooperstown.....	Otsego.....	2.58	36	4.33	+1.75	6.02	1881	0.97	1877
Palermo.....	Oswego.....	3.84	36	3.48	-0.36	7.95	1878	1.60	1874
North Carolina.									
Lenoir.....	Caldwell.....	3.78	16	2.50	-1.28	8.70	1877	0.50	1889
Ohio.									
N. Lewisburgh...	Champaign..	2.94	18	1.85	-1.09	5.45	1873	1.50	1882
Wauseon.....	Fulton.....	2.39	18	1.16	-1.23	4.32	1879	0.41	1874
Oregon.									
Albany.....	Linn.....	8.62	11	4.92	-3.70	14.21	1887	4.30	1888
Eola.....	Polk.....	5.80	21	4.33	-1.47	11.50	1880	0.84	1876
Pennsylvania.									
Dyberry.....	Wayne.....	2.64	24	5.29	-2.65	5.29	1890	1.20	1874
Grampian Hills..	Clearfield...	3.69	20	4.15	-0.46	5.12	1872	1.99	1871
Wellsborough.....	Tioga.....	4.72	11	4.97	-0.25	9.57	1881	1.27	1883
South Carolina.									
Statesburgh.....	Sumter.....	3.17	9	1.81	-1.36	5.87	1884	0.75	1889
Tennessee.									
Austin.....	Wilson.....	4.29	20	3.03	-1.26	10.20	1879	0.85	1882
Texas.									
New Ulm.....	Austin.....	4.36	17	1.27	-3.09	16.43	1875	0.37	1889
Vermont.									
Strafford.....	Orange.....	3.26	17	3.30	+0.04	5.90	1878	0.15	1875
Virginia.									
Birdsneat.....	Northampton	3.63	21	6.30	+2.67	6.75	1880	0.55	1889
Washington.									
Fort Townsend...	Jefferson....	2.58	16	3.30	+0.72	5.10	1886	1.14	1879
Wisconsin.									
Madison.....	Dane.....	2.05	18	0.62	-1.43	5.73	1884	0.45	1874

EXCESSIVE PRECIPITATION.

Precipitation to equal or exceed 10.00 was reported at 3 stations in Washington, the greatest amount, 22.09, being noted at Neah Bay.

In December of preceding years monthly precipitation to equal or exceed 10.00 has been reported for 26 years in Oregon; for 24 years in Cal.; for 15 years in Wash.; for 11 years in Miss.; for 8 years in Tex. and La.; for 6 years in Fla. and N. C.; for 4 years in Ala., Ark., and Ga.; for 3 years in Mass. and N. Y.; for 2 years in Ind., Ky., Mo., N. H., Ohio, and Tenn.; and for 1 year in Ariz., Mich., Nev., N. J., and

Va. In states and territories other than those named precipitation to equal or exceed 10.00 has not been reported for December. Among the heavier rainfalls reported for December are: in California, 20.60, at Fort Miller, in 1852; 28.65, at Fort Gaston, in 1864; 20.55, at Fort Gaston, in 1866; 22.19, at Fort Gaston, 1867; 24.67, at Camp Wright, in 1866; 29.03, at Camp Wright, 1867; 30.35, at Meadow Valley, in 1866; 41.95, at Nevada City, in 1867; 23.76, at Shingle Springs, in 1867; 28.39, at Cisco, in 1871; 20.42, at Healdsburg, in 1871; 41.87, at Pilarcitos, in 1871; 51.05, at San Andreas, in 1871; 28.88, at Summit, in 1871; 28.91, at Mount Saint Helena, in 1880; 24.34, at Mumford Hill, in 1880; 32.07, at Reed's Camp, in 1880; 21.85, at Vacaville, in 1880; 31.20, at Emigrant Gap, in 1884; 25.05, at Cisco, in 1884; 23.60, at Colfax, in 1884; 33.84, at Mount Hamilton, in 1884; 20.96, at San Rafael, in 1884; 26.26, at Crescent City, in 1885; 22.69, at Grass Valley, in 1888; and 29.36, at Upper Mattole, in 1889. Precipitation to exceed 20.00 in December has been reported for 8 years in Oregon; for 5 years in Wash.; and for 1 year in Tex. and La. Exclusive of the instances and years cited precipitation to equal or exceed 15.00 in December has been reported for 9 years in Oregon; for 7 years in Wash.; for 6 years in Cal.; for 2 years in Tex.; and for 1 year in Ala., Ark., Fla., La., N. H., N. Y., and N. C.

Precipitation to equal or exceed 2.50 in 24 hours was reported at 5 stations in La., and on 4 dates, the 5th to 7th and 25th; at 5 stations in Miss., on the 6th; at 4 stations in Cal., and on 3 dates, the 2d to 4th; at 2 stations in N. Y., and on 2 dates, the 17th and 18th; at 2 stations in Va., and on 4 dates, the 16-17th and 25-26th; at 2 stations in Wash., and on 2 dates, the 20th-21st; at 2 stations in Tenn., and on 2 dates, the 6th and 25th; at 1 station in Ark., on the 6th; at 1 station in Fla., on the 14th; at 1 station in Me., on the 27th; and at 1 station in Pa., on the 17-18th. Among the heavier rainfalls reported for this period are: 6.15, at Farmerville, La., 5th; 4.89, at Washington, Miss., 6th; and 4.00, at Arkansas City, Ark., 6th.

In December of preceding years precipitation to equal or exceed 2.50 in 24 hours has been reported for 13 years in Cal.; for 12 years in Tex.; for 11 years in Ga. and N. C.; for 10 years in Fla. and La.; for 9 years in Ala. and Oregon; for 8 years in Miss. and Tenn.; for 7 years in Ill., Ind., and Va.; for 6 years in Ohio, Pa., S. C., and Wash.; for 5 years in Kans. and Md.; for 4 years in Ky., Mass., Mo., and N. Y.; for 3 years in Ark., Del., N. J., and Mich.; for 2 years in Ariz., Iowa, Me., and N. H.; and for 1 year in Conn., Ind. T., Utah, and Vt. In states and territories other than those named precipitation to equal or exceed 2.50 in 24 hours has not been reported for December of preceding years. Among the heavier rainfalls reported for this period in December of preceding years are: 13.50, at Point Pleasant, La., 19th, 1882; 6.60, at Fort Gaston, Cal., 24-25th, 1883; 6.65, on the 2-3d, and 9.04, on the 23d-24th, at Mount Saint Helena, Cal., in 1880; 12.15, at Monroe, La., 29-30th, 1884; 6.00, at Fayetteville, N. C., 9-10th and 20th-21st, 1878; 6.33, at Micco, Fla., 24th, 1888; 8.47, Yaquina Light-house, Oregon, 5-6th, 1887; at Clarksville, Tex., 8.50, 29-30th, 1874, and 8.50, 28-29th, 1876; 6.74, at Lynchburgh, Va., 21st, 1884. Exclusive of the instances and years cited precipitation to equal or exceed 5.00 for the period named has been reported for 2 years in Fla., and for 1 year in Ala., Cal., Ill., La., Mo., N. Y., N. C., and Tex.

Precipitation to equal or exceed 1.00 in 1 hour was reported at 3 stations in La., and on 3 dates, the 5th, 7th, and 25th; at 1 station in Ga., on the 8th; and at 1 station in Tex., on the 24th. Remarkably heavy rainfall in one hour was not reported for December, 1890, and excessive rainfall for 5 and 10 minute periods is given in the table of "Maximum rainfall in one hour or less."

In December of preceding years precipitation to equal or exceed 1.00 in 1 hour has been reported for 5 years in Tex.; for 3 years in Cal.; for 2 years in Fla., Ind., Ill., Pa., and Tenn.; and for 1 year in Ala., Ark., Kans., La., Mass., Mich., and

Miss. In states and territories other than those named precipitation to equal or exceed 1.00 has not been reported for December of preceding years. Among the heavier rainfalls reported for 1 hour or less in December of preceding years are: 1.20, in 20 minutes, at Wellsborough, Pa., 7th, 1884; 1.36, in 20 minutes, at Clarksville, Tex., and 1.36, in 20 minutes, at Galveston, Tex., 28th, 1871; and 1.00, in 20 minutes, at Winnebago, Ill., 21st, 1889.

Table of excessive precipitation, December, 1890.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Arkansas.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	<i>h. m.</i>	
Arkansas City.....	4.00	6				
<i>California.</i>						
Fort Gaston.....	3.45	3.4				
Grass Valley.....	2.60	3				
Iowa Hill.....	2.61	4				
Los Gatos (2).....	2.70	2.3				
<i>Florida.</i>						
Merritt's Island.....	2.82	14				
<i>Georgia.</i>						
Savannah.....				1.20	1 00	8
<i>Louisiana.</i>						
Amité City.....	4.76	7				
Farmerville.....	6.15	5				
Grand Cane.....	3.50	5.0				
Homer.....	3.00	5		3.00	1 00	5
Luling.....	2.69	25				
New Orleans.....				1.25	1 00	25
Sugar Experiment Station.....				1.60	1 00	7
<i>Maine.</i>						
Bar Harbor.....	2.65	27				
<i>Mississippi.</i>						
Payette.....	3.39	6				
Greenville.....	2.55	6				
Kosciusko.....	4.00	6				
Washington.....	4.89	6				
Pontotoc.....	2.55	5.6				
<i>New York.</i>						
Pine City.....	3.50	16				
Setauket.....	3.20	17				
<i>Pennsylvania.</i>						
Wellsborough.....	2.75	17, 18				
<i>Tennessee.</i>						
Andersonville.....	2.50	25				
Savannah.....	2.85	6				
<i>Texas.</i>						
Galveston.....				1.30	1 00	24
<i>Virginia.</i>						
Lynchburgh.....	3.13	16, 17				
Norfolk.....	2.50	25, 26				
<i>Washington.</i>						
Lapush.....	11.24					
Neah Bay.....	22.09	3.01	20, 21			
Olympia.....	2.75	20, 21				
Tatoosh Island.....	19.57					

SNOW (in inches and tenths).

Chart V shows the depth of snowfall reported for the month. The greatest depth of snowfall reported was 86.0, at Blue Knob, Pa. The snowfall exceeded 70.0 along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains in California. It exceeded 60.0 in southwest and northeast Pennsylvania; 50.0 in central New York, and at Cumbres, Colo.; 40.0 in south-central and southwest Maine, north New Hampshire, north-central Virginia, and southeast Ohio; 30.0 in west-central lower Idaho, north-central New Mexico, generally in Vermont, and in north West Virginia; 20.0 in northeast Massachusetts, west Maryland, north lower and upper Michigan, west-central Nevada, east Ohio, and north-central Utah; and 10.0 in the mountains of southeast Arizona, and central Colo., northeast Oregon, central and southwest Montana, north-central South Dakota, northeast Wisconsin, north-central Iowa, east-central Missouri, southeast Kansas, north-central Kentucky, south-central Illinois, south Indiana, south and north New Jersey, east Maryland, District of Columbia, and west North Carolina. No snowfall was reported south of a line traced from the central North Carolina coast south of west to central Georgia, thence northwestward to extreme southeast Missouri, and thence irregularly south of west to southwest New Mexico. The western limit of snow is shown by a line traced from south-central Arizona northwestward to south Nevada, thence to central

California in about latitude N. 36°, thence west of north over the east valleys of the San Joaquin and Sacramento rivers to northwest California, and thence east of north over Oregon and Washington.

Snowfall of 10.0, or more, was reported as follows, and in states and territories where the maximum depth was below that amount, the station reporting the greatest is given: *Alabama.*—Mountain Home, trace. *Arizona.*—Chiri Cahua Mountains, 14. *Arkansas.*—Lead Hill, 6.5. *California.*—Summit, 74; Cisco, 65; Emigrant Gap, 44; Boca, 34.5; Truckee, 33; Susanville, 15.5. *Colorado.*—Cumbres, 54; Pagosa Springs, 19; Stamford, 18.5; Dillon, 13.8. *Connecticut.*—New Hartford (1), 18.5; New Hartford (2), 18; Canton, 15; West Simsbury, 13; Falls Village, 12; Hartford (1), 10.8. *Delaware.*—Dover, 8. *District of Columbia.*—Washington City, 13. *Georgia.*—Diamond, 3.8. *Idaho.*—Placerville, 36. *Illinois.*—Louisville, 20; Centralia, 15; Olney (1), 13.2; Pana, 13; Greenville, 12.2; Grand Tower, Palestine, and Rockford, 12; Jordan's Grove, 11.5; Martinsville and Mascoutah, 11; McLeansborough and Winnebago, 10. *Indiana.*—Princeton, 15.5; Seymour and Worthington, 14.5; Vevay, 13.4; Cannelton and Columbus, 13; Butlerville, 12.2; Mauzy, 12; Franklin, 11.5; Indianapolis, 11.4; De Gonia Springs, 11; Muncie, 10. *Iowa.*—Hampton, 11.2. *Kansas.*—Oswego, 10. *Kentucky.*—Shelbyville, 10. *Maine.*—Lewiston, 46; Farmington, 44.5; Cornish, 36.5; Kent's Hill, 36; Orono, 28.5; Fairfield, 28; Belfast, 27; Calais, 22; Bar Harbor, 18; Fort Preble, 15; Portland, 14. *Maryland.*—Cumberland (1), 26; Mount Saint Mary's, 15; Cumberland (2), 14.5; Baltimore, 10.6; Woodstock, 10.3. *Massachusetts.*—Concord, 21.6; Andover, Groton (1), and Lawrence, 20; North Billerica, 19; Fitchburgh (2), Gilbertville, and Newburyport (1), 18; Amherst Experimental Station (2), Mount Nonotuck, Salem (2), Wakefield, and Westborough, 16; Amherst Experimental Station (1), 15.5; Royalston, 14.6; Kendall Green and Leominster, 14; Springfield Armory, 13; Leicester and Ludlow (1), 12; Dudley, 11.4; Fall River (1), Mansfield, and Monson, 11; Amherst, Framingham, Somerset, and Taunton (2), 10. *Michigan.*—Charlevoix, 29.5; Marquette, 28.7; Sault de Ste. Marie and Sand Beach, 26; Harrisville, 25.2; Fort Brady, 24.8; Northport, 22.4; Atlantic, 21; Roscommon, 20; Bangor, 19.7; Alpena, 18.1; Parkville, 17.7; Grayling, 17.5; Otsego, 17; Kalamazoo, 16.5; Grape, 16.3; Ypsilanti (1), 16.2; Ivan, 16.1; Bronson, 16; Allegan and Weldon Creek, 15.5; Cassopolis, 15; Gulliver Lake, 14.8; Noble, 14.7; Fitchburgh, Fort Wayne, and Pontiac, 14.5; Ionia, 14.4; Paw Paw, 14.2; Cheboygan, 14; Albion (1), 13.6; Eden, Rawsonville, and Thornville, 13.5; Colon, 13.4; Ann Arbor, 13.3; Ball Mountain, 13.1; Caldwell, Harbor Springs, and Manton, 13; Mottville and Port Huron, 12.8; Marshall, Olivet, and Saint Ignace, 12.5; Fairview, 12.4; Stockbridge, 12.1; Calumet and Ypsilanti (2), 12; Highland Station, 11.6; Howell and Stanton, 11.5; Hanover, 11.4; Madison, 11.3; Birmingham, 11.2; Vandalia, 11.1; Benton Harbor and Lathrop, 11; Grand Haven, 10.8; Hastings, 10.6; Fremont, Pulaski, Saint John's, and Washington, 10.5; Berlin, 10.2; Adrian, Alma, Clinton, May, and Williamstown, 10. *Minnesota.*—Sheldon, 5.9. *Missouri.*—Hermann and Saint Louis, 11; Springfield and Steelville, 10. *Montana.*—Virginia City, 18; Martinsdale, 16; Helena, 12; Choteau, 11; Powder River, 10. *Nebraska.*—Hay Springs, 3.5. *Nevada.*—Virginia City, 24.5; Lewer's Ranch, 16; Belmont, 15.8; Verdi, 12.5; Austin, 11; Carson City, 10.1; Ely, 10. *New Hampshire.*—North Conway, 45; Berlin Mills, 41.5; Hanover (1) and West Milan, 36; Hanover (2), 32.5; Walpole, 32; North Sutton, 31; Plymouth, 29; Stratford, 28; Antrim and Concord, 27; Littleton, 26; East Canterbury, 23.5; Manchester, 23.1; Newton, 23; Manchester (1), 20; Nashua, 19.2. *New Jersey.*—Cape May, 13.5; Newton, 12; Belleville, 11.5; Asbury Park, 11; Gillette, Ocean City, and Oceanic, 10. *New Mexico.*—Chama, 31; Fort Marcy, 21; Cuba, 19; Monero, 14.6; Coolidge, 14; Embudo, 13; Santa Fé, 11.9. *New York.*—Turin, 65; Utica, 59; Brookfield, 57.5; Pine City, 56.9; Le Roy, 52.2; Apulia, 46; Lyon Mountain, 42.9; Addison, 42.3; South Canisteo, 40.4;

Wedgwood, 38; Perry City, 37.8; Quaker Street, 37; Newark Valley, 36; Lyons, 35.8; Alabama, Cooperstown, and Scho-dack Depot, 34; Oxford, 33.5; Ithaca, 32.3; Rochester, 29.2; New Lisbon, 28.8; Adams Centre and Baldwinsville, 27.5; Oswego, 26.4; Easton, 26.2; Keene Valley, Galway, and Watervliet Arsenal, 26; Albany, 25.9; Demster, 25.5; Chenango Forks, 25; Ogdensburgh and Plattsburgh Barracks, 24.5; Buffalo, 24.4; Plattsburgh and Sand Bank, 24; Palermo, 23.8; Deposit, 22.5; Hammondsport, 22; Wappinger's Falls, 21.5; Geneva, 20.8; Akron, 20.2; Rondout, 19.5; New York City, 19.1; Sherman, 19; Fleming and Lowville, 18; Madison Barracks, 17; Malone and Palmyra, 16.5; Romulus, 16.2; Pendleton Centre, 16; Middletown, 15.5; De Kalb Junction, 14.2; Canton, 13.9; Honeymead Brook, 13.4; Arcade (1), 13.1; Ardenia, Port Jervis, and Willets Point, 13; Fort Schuyler, 12.5; Potsdam and White Plains, 12; Central Park (New York City), 11.4; Boyd's Corners, 10.8; Liberty, 10. *North Carolina*.—Murphy, 14.5; Mt. Airy, 11.5. *North Dakota*.—New England City, 5. *Ohio*.—New Alexandria, 41.5; Demos, 27; Garrettsville, 25; McConnells-ville, 22; Youngstown, 21.7; Vienna, 19; Gratiot, 18.7; Hiram, 18.4; Orangeville, 18; Akron, 17.5; Ellsworth and Lordstown, 17; Jacksonborough, 16; Logan, 15.3; Oberlin, 15.2; Wey-mouth, 14.5; New Comerstown, 14; Columbus, 13.5; Canton and Marietta (2), 12.5; Ashland, 12; Columbus Barracks and Hassan, 11.5; Athens, 11; Georgetown, 10.6; Waynesville, 10.5; Pomeroy and Toledo, 10.4; Waverly, 10.2; Marietta (1), Springborough, Wauseon, and Wheeler, 10. *Oklahoma Ter-ritory*.—Fort Reno, 1. *Oregon*.—Joseph, 10.8. *Pennsylvania*.—Blue Knob, 86; Eagle's Mere, 65.2; Somerset, 60; Le Roy, 57.1; Philipsburgh, 51.5; Troy, 50; Indiana, 49.7; Wells-borough, 48.8; Rimersburgh, 45; Lock Haven, 42.8; Johns-town, 42; Pittsburgh, 41.3; Grampian Hills, 41; Hollidays-burgh, 36.7; Charlesville and Dyberry, 35.5; Salem Corners, 34.8; Allegheny Arsenal, 34.7; Huntingdon, 33.5; State College, 32.6; Catawissa, 32; Smethport, 31.5; Emporium, 31.2; Nisbet, 31; Wysox, 29.5; Meadville (2), 29.2; McCon-nellsburgh, 26; Blooming Grove and Petersburg, 25; Green-ville and Uniontown, 24.5; Du Bois and South Eaton, 24; Girardville, 23.7; Kilmer, 23.6; Carlisle, 23; Lewisburgh, 22.9; Ligonier, 22.3; Selin's Grove, 21; Honesdale, 20; Wilkes Barre, 19.8; Oil City, 19; York, 18.5; Aqueduct, 17; New Castle, 16.9; Harrisburg, 15; Myerstown, 14; Coatesville, 12.6; Corry and Westtown, 12; West Chester, 11. *Rhode Island*.—Pawtucket and Providence (1), 10. *South Carolina*.—Belmont, 1. *South Dakota*.—Scranton, 10.5. *Tennessee*.—Rogersville and Spring-dale, 6. *Texas*.—Coldwater, 3.2. *Utah*.—Alta, 24; Park City, 14.2. *Vermont*.—Jacksonville, 38; Northfield, 36.2; Chelsea, 36; Hartland, 35; Lunenburg, 31; Strafford, 30; East Berk-shire, 27.6; Burlington, 25; Cornwall, 22; Brattleborough (1), 12.2. *Virginia*.—Bolar, 47.9; Salem, 36.1; Staunton, 36; Dale Enterprise, 28.5; Lexington, 26.2; Woodstock, 21.5; Lynch-burgh, 13.5; Mossing Ford, 12. *West Virginia*.—Ella, 32.2; Tannery, 31.8; Glenville, 25; Wheeling, 22. *Wisconsin*.—De Pere, 10. *Wyoming*.—Cheyenne and Laramie, 1.

The first snow of the season was reported as follows: 1st, Oregon, Mo.; Readington, N. J.; Kenton, Ohio; Salem, Va. 2d, Amana and McCausland, Iowa. 3d, Springfield, Ill.; Casanova, Va. 4th, Teviston, Ariz.; Columbia, Mo. 5th, Mount Turnbull (near San Carlos), Ariz. 6th, Show Low, Fort Bowie, Fort Grant, and Fort Thomas, Ariz.; Dodge City, Cunningham, and Oswego, Kans.; Sarcoxie, Mo.; Oklahoma City, Okla. T.; Panhandle and Silver Falls, Tex. 7th, Moun-tain Home, Ala.; Fort Smith and Lead Hill, Ark.; Columbus and Sedan, Kans.; Louisville, Earlington, and Pearlinton, Ky.; Liberty, Oak Ridge, Saint Charles, Warrenton, Saint Louis, Springfield, Centreville, and Gordonville, Mo.; Fort Reno, Okla. T.; Riddleton, Tenn.; Bolar, Va. 8th, Cairo and Palestine, Ill.; Barren Creek Springs and Cumberland, Md.; Steelville, Mo.; Woodbury, N. J.; Soapstone Mount and Weldon, N. C.; Chattanooga, Tenn.; Lynchburgh, Norfolk, Birdsnest, Lexington, Mossing Ford, Stanardsville, Staunton, and Yancey's Mills, Va. 12th, Mesquite, Tex. 13th, Baker

City, Oregon. 16th, Atlanta and Lithia Springs, Ga.; Peoria, Ill.; Bryson City, Mount Pleasant, Oak Ridge, and Morganton, N. C.; Greenville, Belmont, Kirkwood, Simpsonville, and Spartanburgh, S. C. 17th, Diamond, Ga.; Charlotte, Raleigh, and Murphy, N. C. 24th, Topeka, Globe, La Harpe, Man-hattan, Salina, and Wakefield, Kans.; Carrollton, Fayette, Fortescue, Glasgow, Shelby, and Stellada, Mo. 25th, Austin, Mo.; Cape Henry and Fall Creek, Va. 26th, Concordia, Kans. 30th, Grass Valley, Cal. 31st, Dos Cabezas, Ariz.

The following are among the more notable snow storms of the month: On the 3d 5.0 to 6.0 inches of snow fell in north and west New York, north Vermont, and north New Hamp-shire. Snow was reported in the mountain districts of north California from the 2d to 5th. On the 6th and 7th a heavy snow storm prevailed in southwest Missouri, north Arkansas, Indian Territory, and southeast Kansas, a depth of 7.0 to 10.0 inches being reported. From the 16th to the 18th a heavy snow storm prevailed from North Carolina to New York and westward over the upper Ohio valley. In west North Caro-lina 5.0 to 8.0 inches fell; in West Virginia the depth was 13.0 to 22.0 inches; in west and southwest Virginia 15.0 to 36.0 inches; at Roanoke, Va., the roof of the Roanoke Ma-chine Works was crushed in by the weight of snow and one man killed and several injured; other buildings also caved in at that place under the weight of the snow. At Troy, Pa., 32.0 inches fell; at Pittsburgh, Pa., the estimated depth from 10 a. m. of the 16th to 3 a. m. of the 18th was 16.5 inches. At State College, Ohio, 8.0 inches fell. Light snow was reported in north Georgia and west South Carolina. On the 17th and 18th heavy snow fell from east New York over north New England, and at mountain stations in Pennsylvania. At Farmington, Me., 15.5 fell; in north New Hampshire and east New York 11.0 to 14.0; and in Pennsylvania 14.0 to 26.0 inches were reported. At Murphy, N. C., a depth of 14.5 inches was reported during this storm. On the 23d and 24th a depth of 12.0 was reported at Harper's Ferry, W. Va. A heavy snow storm which prevailed in south Indiana, Illinois, and Ohio, and in Kentucky, south Missouri, Virginia, District of Columbia, and west North Carolina on the 24th and 25th extended over Pennsylvania, New Jersey, New York, and New England by the 26th and 27th. In central Kentucky snow changed into sleet on the 25th, and trees and electric wires were broken by the weight of ice. A depth of 10.0 was reported at Butler-ville, Ind.; 10.0 at Caddo Creek, Ky.; 4.5 at Louisville, Ky.; 7.0 at Cincinnati, Ohio; 10.0 at Jacksonborough, Ohio; 7.0 at Columbus, Ohio; 11.0 at Pittsburgh, Pa.; 4.5 at Lynchburgh, Va.; 10.0 at Washington City; 13.0 at Cumberland, Md.; 12.0 at Mount Saint Mary's, Md.; 8.0 at Dale Enterprise, Va.; 10.0 at Staunton, Va.; 10.0 at Wheeling, W. Va.; 20.0 at Blue Knob, Pa.; 15.0 at Dyberry, Pa.; 7.0 at New Brunswick, N. J.; 13.0 at New York City; 11.0 at Rondout, N. Y.; 10.0 at Cooperstown, N. Y.; 9.0 at Ithaca, N. Y.; 9.0 at Boston, Mass.; 11.0 at Amherst, Mass.; 12.0 at Westborough, Mass.; 10.0 at Springfield, Mass.; 14.0 at Strafford, Vt.; 15.0 at North Sutton, N. H.; 16.0 at Hanover, N. H.; 14.0 at Antrim, N. H.; and 14.0 at Cornish, Me.

DEPTH OF SNOW ON GROUND AT CLOSE OF MONTH.

Chart IV shows the depth of snow reported on the ground at the close of the month. The greatest depth of snow was reported in southwest Me., north N. H., south Vt., central N. Y., northeast and south-central Pa., and west-central Idaho, where it exceeded 30.0. 20.0 was reported in north-central Va., and more than 10.0 in central and northeast Mass., central and north Conn., north N. J., west Md., northeast W. Va., east Ohio, east upper Mich., north-central Utah, and north-central N. Mex. Trace of snow was reported on the ground in the Atlantic coast states as far south as extreme south Va.; in the Ohio and Mississippi Valleys to north Ky. and south Ill.; in the Missouri Valley to northwest Mo.; on the eastern slope of the Rocky Mountains to northwest Tex.; in the plateau region to south-central N. Mex., south Utah, and central Nev., and in Cal., to about the 38th parallel.

HAIL.

Hail was reported as follows: 3d, Ala., Cal., Fla., Ga., Miss., Tenn. 4th, Ariz., Kans. 5th, Ariz. 6th, Wash. 7th, Kans. 10th, N. J. 12th, Tex., Wash. 13th, Tex. 14th, Wash. 17th, N. C. 19th, Cal., Wash. 20th, Ariz. 26th, N. J., N. C. 29th, Nev., Wash. 30th, Ariz., Cal., Nev. 31st, Kans.

SLEET.

Description of the more severe sleet storms of the month is given under "Local storms." Sleet was reported as follows: 2d, Mich., Va. 3d, Conn., Ind., Me., N. H., N. J., N. Y., Ohio, Pa. 4th, Me., N. H. 5th, Me., N. H., N. J., Utah, Wis. 6th, Me., Mass., Pa., Tex. 7th, Ark., Ill., Ind., Ky., Tenn., Va. 8th, Ky., N. C., Va. 9th, N. C., Ohio. 11th, Mich. 12th, N. Y., Tex. 14th, Wash. 15th, Iowa, Mich., W. Va. 16th, Ind., N. C., Ohio, S. C., Tenn., Va., Wis. 17th, Conn., Me., Mich., N. Y., Pa., Vt., Va. 18th, Me., Mich., Pa., Vt. 19th, Mich. 20th, Mich. 21st, N. Y., Pa. 22d, Mich., Mont., N. C., Pa. 23d, N. J., N. Y. 24th, Ill., Kans., Ky., Mo., Tenn. 25th, Ind., Ky., Mo., N. J., N. C., Ohio, S. C., Va., W. Va. 26th, Conn., D. C., Iowa, Ky., Mass., N. H., N. J., N. Y., N. C., N. Dak., Pa., Tenn., Va., Wis. 27th, Me., Mass., N. H., N. Y., Pa. 30th, Mich. 31st, Colo., Iowa, Kans., La., Md., Minn., Mo., N. Mex., N. Y., Pa.

MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during December, 1890, for periods of five and ten minutes and

one hour, as reported by regular stations of the Signal Service furnished with self-registering gauges:

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
Bismarck, N. Dak.	Inch.		Inch.		Inch.	
Boston, Mass.	0.05	26	0.12	26	0.40	26
Buffalo, N. Y.						
Cincinnati, Ohio						
Chicago, Ill.						
Cleveland, Ohio	0.02	31	0.03	31	0.10	31
Denver, Colo.						
Detroit, Mich.						
Dodge City, Kans.	*		*		0.05	31
Duluth, Minn.						
Eastport, Me.						
Galveston, Tex.	0.20	24	0.35	24	1.30	24
Jupiter, Fla.	0.15	14	0.20	14	0.40	14
Key West, Fla.	0.04	4	0.07	4	0.22	4
Marquette, Mich.						
Memphis, Tenn.						
New York City	0.03	17	0.05	17	0.24	17
New Orleans, La.	0.30	5	0.50	5	1.25	25
Norfolk, Va.						
Philadelphia, Pa.						
Philadelphia Water Works	0.02	17	0.04	17	0.21	17
Portland, Oregon	0.05	23	0.06	23	0.20	23
Saint Louis, Mo.						
Saint Paul, Minn.						
San Diego, Cal.	0.05	4	0.10	4	0.30	4
San Francisco, Cal.	0.15	3	0.30	3	0.45	3
Savannah, Ga.	0.25	8	0.50	8	1.20	8
Washington City	0.10	17	0.10	17	0.20	17
Wilmington, N. C.	*		*		0.05	10

* Not sufficient to register. † Rain-gauge not working. ‡ Less than .05 in 1 hour. § No record on account of snow.

WINDS.

The prevailing winds during December, 1890, are shown on chart II by arrows flying with the wind. In New England and the middle Atlantic states the winds were generally from the northwest; in the south Atlantic states, from southwest to west, except on the North Carolina coast, where they were from the northeast; over the Florida Peninsula, from west to northwest; in the east Gulf states and on the middle Pacific coast, from northwest to north, except on the coast of north California, where they were from the southeast; in the lower Rio Grande valley and on the north Pacific coast, from east to south; in the Ohio Valley and Tennessee, the extreme northwest, on the southeast slope of the Rocky Mountains, and over the middle plateau region, from south to northwest, except at Winnemucca, Nev., where the prevailing direction was from the east; in the lower lake region, the upper Mississippi and Missouri valleys, and on the northeast slope of the Rocky Mountains, from southwest to northwest; on the middle-eastern slope of the Rocky Mountains, and over the southern plateau region, from southwest to north; over the northern plateau region, from southeast to southwest; on the south Pacific coast, from west to north; and in the west Gulf states and the upper lake region, variable.

HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Signal Service, as follows: 1st, 62, sw., at Fort Canby, Wash. 2d, 70, e., at Fort Canby, Wash. 3d, 66, e., at Fort Canby, Wash. 4th, 52, se., at Eastport, Me.; 58, w., at Wood's Holl, Mass.; 55, nw., at Block Island, R. I. 9th, 55, sw., at Fort Assinniboine, Mont. 11th, 54, e., at Fort Canby, Wash. 12th, 82, se., at Fort Canby, Wash. 13th, 54, sw., at Chicago, Ill. 14th, 64, se., at Fort Canby, Wash.; 50, nw., at Wood's Holl, Mass. 15th, 72, s., at Fort Canby, Wash. 16th, 60, sw., at Fort Assinniboine, Mont.; 70, s., at Fort Canby, Wash. 17th, 50, sw., at Fort Assinniboine, Mont.; 60, se., at Fort Canby, Wash.; 54, ne., at Boston, Mass.; 82, ne., at Block Island, R. I.; 52, ne., at New Haven, Conn.; 64, ne., at Harrisburg, Pa. 18th, 50, nw., at Block Island, R. I.; 60, s., at Fort Canby, Wash. 19th, 56, sw., at Fort Canby.

Wash.; 60, nw., at Wood's Holl, Mass. 20th, 76, s., at Fort Canby, Wash. 21st, 72, sw., at Fort Assinniboine, Mont.; 64, s., at Fort Canby, Wash. 23d, 50, nw., at Chicago, Ill.; 54, sw., at Buffalo, N. Y.; 51, sw., at Detroit, Mich.; 51, w., at Grand Haven, Mich.; 50, nw., at Sault de Ste. Marie, Mich. 25th, 50, sw., at Fort Assinniboine, Mont.; 60, w., at Helena, Mont.; 84, sw., at Fort Canby, Wash. 26th, 69, e., at Block Island, R. I.; 58, nw., at Bismarck, N. Dak.; 60, nw., at Fort Buford, N. Dak.; 52, nw., at Valentine, Nebr.; 54, nw., at Yankton, S. Dak.; 54, nw., at Fort Sully, S. Dak. 27th, 54, se., at Eastport, Me. 28th, 52, nw., at Wood's Holl, Mass. 31st, 60, w., at Abilene, Tex.

LOCAL STORMS.

On the 1st a violent wind and rain storm prevailed over Nova Scotia, Cape Breton Island, and Newfoundland. At Halifax the rain changed to snow, which drifted heavily. Great damage was caused to shipping along the coasts of the Canadian Maritime Provinces by heavy wind and high seas. On the morning of the 3d a violent thunder-storm moved eastward over Pensacola, Fla., with hail about the size of peas, and wind reaching a velocity of 44 miles per hour. A heavy w. to n. gale swept over southeast Massachusetts on the 4th. At Wood's Holl, Mass., a heavy gale, reaching 58 miles per hour, and snow, changing into rain, prevailed. Two schooners went ashore near that place and were abandoned by their crews. On the 5th a heavy rain and thunder-storm passed over Farmerville, Union Co., La., and a violent wind storm, causing damage to out-buildings, was reported at Love's Lake, Red River Co., La. On the 8th, at 9 p. m., central time, a storm moved ne. over Jersey, Walton Co., Ga., damaging buildings to the extent of about \$500, and killing one person. The path of greatest destruction was about two miles in length and about 50 yards in width. Articles were carried upward and to the north, and the storm had a whirling motion from right to left. On the 12th a high wind, reaching 45 miles per hour, prevailed in New York City. In Brooklyn a building in course of erection was blown down and one person killed. On the 13th a heavy sw. gale prevailed at Grand Haven, Mich., with a maximum velocity of 48 miles per hour.

A heavy sea was running on the lake, and no vessels arrived or departed. On the 17th heavy gales prevailed in the Atlantic coast states from North Carolina to Maine. A report from Southport, N. C., states that a schooner went ashore on Piney Point Beach, about 3 miles sw. of that place. At Washington City heavy rain and high wind from the ne. caused considerable damage; maximum wind velocity 48 miles, with an extreme velocity of 50 miles per hour. At Baltimore, Md., the wind reached a velocity of 39 miles per hour from the ne., this being the highest velocity recorded there in December, with one exception; a great amount of damage was reported; vessels in the harbor dragged their anchors, and several small craft were sunk; many roofs were blown off; steamers were delayed; and much damage was caused throughout the state and along the neighboring coasts. At Philadelphia, Pa., the wind reached a velocity of 48 miles per hour, and damage was caused to plate glass store windows, telegraph wires, etc. A ne. gale prevailed at Harrisburg, Pa.; several old houses were unroofed, and poles were blown down. At Woodbury, N. J., a heavy ne. gale, with rain, prevailed. At Atlantic City, N. J., rain and high ne. winds began in the early morning. The tide was unusually high and the meadows were submerged. The electric street car sheds were blown down, and the damage to buildings and cars was estimated at \$10,000. Several other buildings were damaged. At New Brunswick, N. J., a heavy ne. storm of wind and rain set in in the early morning and continued all day, causing high water in the Raritan River, and doing damage to trees, etc. At New York City a severe ne. storm prevailed, the maximum wind velocity, 48 miles, being reached at 4.25 p. m. Traffic on the rivers and bays was practically suspended. Many wrecks were reported along the coast. Much damage was caused along the New Jersey coast by high seas. In the vicinity of New York City 17 schooners were dismasted and 4 steamers driven ashore. At New Haven, Conn., a heavy ne. gale prevailed, with heavy rain, in the afternoon and evening. Much damage was done to electric lights; cellars were flooded, and steamers were delayed. At Block Island, R. I., a violent ne. storm, with a maximum wind velocity of 82 miles per hour at 6.23 p. m., and an extreme velocity of 96 miles per hour, prevailed. Buildings, etc., were damaged to the extent of about \$1,000.

On the 23d a heavy wind storm prevailed over the Lake region. At Barberton, 5 miles south of Akron, Ohio, a building was demolished, killing one person and injuring several. At Sault de Ste. Marie, Mich., the storm was the severest of the season, high wind and snow continuing all day; maximum wind velocity 50 miles per hour from the nw. The roof of a hotel was damaged to the extent of about \$500. At Milwaukee, Wis., the wind attained a velocity of 42 miles per hour from the nw., and all vessels remained in port. At Detroit, Mich., the wind reached a velocity of 51 miles from the sw.; a market building was blown down, and 3 persons seriously injured. At Buffalo, N. Y., the wind reached a velocity of 54 miles per hour, and the lake was very rough. On the 25th a severe storm of wind and rain prevailed over Washing-

ton, Oregon, and west Montana. At Seattle, Wash., a gale from the sw., with rain, began 5 a. m. and ended 9 a. m., the estimated wind velocity being 60 miles per hour. Shipping was damaged to the extent of about \$20,000, and on the railroads the damage amounted to about \$30,000. At Olympia, Wash., a wind storm, with rain, began 7.15 a. m. and ended 9.25 a. m., with maximum velocity 30 miles per hour from the sw. In the city a large barn was blown down, damage \$2,000, and about 12 miles from Olympia 2 men and a horse were killed by a falling tree. Some damage was done on Puget Sound about Tacoma and Seattle. At Portland, Oregon, the wind reached a velocity of 35 miles per hour. At Astoria, Oregon, a violent sw. gale, with rain, began 3 a. m. and ended in the early morning, causing slight damage to shipping and buildings. At Helena, Mont., a heavy w. gale, with maximum velocity 60 miles per hour, prevailed from 4 p. m. to 11.50 p. m., during which out-buildings, roofs, etc., were damaged to the extent of about \$5,000. On the 26th high wind, with heavy snow, prevailed in the middle Atlantic coast states, and New England. At Vineyard Haven, Mass., a fierce e. gale, with heavy snow and rain, began at 6 a. m., during which a schooner and a brig at that port were damaged. At Block Island, R. I., a violent storm from the e., with heavy snow, began 4.20 a. m.; attained a velocity of 69 miles per hour at 6.34 p. m.; an extreme velocity of 108 miles per hour at 6.42 p. m., and ended 9.05 p. m. No damage was reported at that place. At Narragansett Pier, R. I., a high ne. gale began during the early morning, and heavy snow at 8 a. m. A three-masted schooner went ashore one-fourth mile north of the station. The crew were taken off by the life-saving crew. The vessel and cargo, valued at \$20,000, were a total loss. A schooner went ashore 2 miles south of the station. The vessel went to pieces in less than 20 minutes, and before the life-saving crew could reach them the captain, steward, and one sailor were lost. The vessel and cargo, valued at \$20,000, were a total loss. At New Haven, Conn., a heavy ne. gale, with snow and sleet, began 5.50 a. m., and ended before midnight. Traffic on street and railroad cars was interrupted, and the New York boats did not run. At New York City light and heavy snow continued during the day. The wind reached 38 miles per hour from the ne. at 5.05 p. m., and backed to n. at 9.10 p. m. The storm was very severe along the coast, and navigation about New York City was practically suspended. No vessels left the port of New York, and 3 wrecks were reported on the New Jersey and Long Island coasts. At New Brunswick, N. J., a severe ne. gale, with heavy snow, prevailed. The snow drifted heavily, causing delay to trains. At Creighton, Nebr., a severe nw. gale caused damage to chimneys, etc. At Sioux City, Iowa, the wind reached a velocity of 36 miles per hour from the s. at 4.05 a. m., and a velocity of 40 miles per hour from the nw. at 4.10 p. m. On the 31st a thunder-storm, doing considerable damage, was reported at Dadeville, Mo. At Abilene, Tex., high s. to w. winds, reaching a velocity of 60 miles per hour from the w., caused much damage to roofs, signs, etc. At Childress, Tex., a heavy gale damaged buildings to the extent of about \$200.

INLAND NAVIGATION.

ICE IN RIVERS AND HARBORS—CLOSING OF NAVIGATION.

Lake Ontario.—A steamer left Oswego, N. Y., on the 13th; this was the last departure of the season.

Lake Erie.—At Buffalo, N. Y., navigation closed on the 8th; no ice visible on the lake or river on that date. 28th, ice on the lake to the outer breakwater, the first ice of the season. At Erie, Pa., the first ice of the season formed on the bay during the night of the 8-9th. At Cleveland, Ohio, the river custom-house closed on the 9th, indicating the closing of navigation for the season. At Sandusky, Ohio, navigation closed on the 6th.

Lake Huron.—Navigation closed at Port Huron, Mich., on the 25th. At Alpena, Mich., floating ice was reported in Thunder Bay River from the 1st to 4th. On the 8th the bay and river were frozen over and navigation fully suspended.

Lake Michigan.—On the 25th considerable floating ice, extending one-half mile out, was reported along the shore of the lake at Chicago, Ill. At Milwaukee, Wis., navigation closed on the 5th.

Green Bay.—Navigation closed at Green Bay, Wis., on the 4th, the lights at Grassy Island and Long Tail Point being discontinued for the season.

Lake Superior.—Navigation closed at Marquette, Mich., on the 3d, and at Duluth, Minn., on the 4th.

Otsego Lake closed at Cooperstown, N. Y., on the 25th, the earliest date since 1878. Lake Champlain was frozen at Plattsburgh Barracks, N. Y., on the 31st.

The Androscoggin River closed at Livermore Falls, Me., and the Penobscot River at Bangor, Me., on the 1st.

Connecticut River.—Reports indicated that navigation closed on the 16th.

Hudson River.—Navigation practically closed on the upper Hudson on the 3d. On the 30th the Hudson and East Rivers were filled with floating ice at New York City, although the ice was not heavy enough to seriously interfere with navigation. Five miles up the Hudson it had been almost entirely suspended. A report from Catskill, N. Y., dated the 8th, stated that "navigation on the Hudson closed this year earlier than it has since the year 1880, and that the dates for the closing of the river at that point are as follows: 1889, January 8; 1888, December 19; 1887, December 22; 1886, December 4; 1885, December 8; 1884, December 19; 1883, December 18; 1882, December 7; 1881, January 2; 1880, December 1. In 1888 the river, though closed on December 19, was subsequently opened, and tow-boats ran until January 20, and the same conditions were possible last year."

Susquehanna River.—Navigation closed at Wilkes Barre, Pa., on the 1st. The river was filled with large cakes of floating ice on the 8th; clear of ice on the 18th; floating ice on the 19th and 20th; closed on the 21st; open on the 24th; and closed on the 28th.

Delaware and Schuylkill Rivers.—On the 3d light ice formed in the Delaware River at Philadelphia, Pa., and the Schuylkill River was frozen over at that point.

Monongahela River.—Navigation was closed at Morgantown, W. Va., on the 28th, and at Greensborough, Pa., on the 29th.

Ohio River.—Floating ice was reported at Marietta, Ohio, on the 11th, 15th, 17th, 19th to 22d, 25th to 27th, and 29th to 31st.

Sandusky River.—The river was frozen at Tiffin, Ohio, on the 3d.

Maumee River.—The river was frozen at Toledo, Ohio, on the 7th, and navigation closed on the 11th.

Detroit River.—Ice was running in the river and navigation was generally closed at Detroit, Mich., on the 3d. Floating ice in the river 6th, 7th, 11th, 15th, 18th, 20th, 25th, and 28th to 30th. The last vessels of the season passed Detroit on the 12th.

Black River.—The river was completely frozen over at Port Huron, Mich., for the first time this season on the 2d.

Saint Mary's River.—The last boat of the season passed down on the 3d, closing navigation.

Mississippi River.—At Saint Paul, Minn., the river was frozen over on the 2d. There was considerable floating ice at La Crosse, Wis., on the 2d. At Red Wing, Minn., the river was frozen over on the 2d. Lake Pepin was frozen during the night of the 2-3d. At Dubuque, Iowa, the river was frozen on the 4th. At Davenport, Iowa, ice was running in the river

on the 3d to 14th, 27th, and 30th. The Rock River was frozen over at Rockford, Ill., on the 4th.

Missouri River.—Ice was running at Fort Buford, N. Dak., on the 2d, and the river closed at that point the night of the 3d-4th. The river was closed at Fort Yates, N. Dak., on the 6th. Ice was running at Fort Sully, S. Dak., from the 1st to 4th, and the river closed at that point on the 6th. On the 8th and 9th a large quantity of ice was running at Leavenworth, Kans.; 10th, river free from ice; 13th, heavy floating ice; 14th, river free from ice; 18th, considerable floating ice; 19th, river free from ice; 25th to 30th, river filled with floating ice. At Kansas City, Mo., floating ice was reported on the 7th, 8th, and 9th. At Saint Joseph, Mo., running ice in the river 5th to 10th and 24th to 30th. On the 31st the river was clear.

Yellowstone River.—Ice was reported in the river at Glendive, Mont., on the 7th.

Eric Canal.—On the 2d water was drawn off west of Little Falls, N. Y. Over fifty boats were reported frozen in, forty between Schenectady and Amsterdam, and about twelve at Crescent.

Morris Canal.—The canal closed for the season on the 18th; several boats were frozen in.

STAGE OF WATER IN RIVERS AND HARBORS.

The following table shows the danger-point at the several stations; the highest and lowest water during December, 1890, with the dates of occurrence and the monthly ranges:

Heights of rivers above low-water mark, December, 1890 (in feet and tenths).

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Date.	Height.	Date.	Height.	
<i>Red River.</i>						
Shreveport, La.	29.9	10	17.7	20	7.7	10.0
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	27	13.3	24	3.0	9.3
Little Rock, Ark.	23.0	30	15.1	24	5.8	9.3
<i>Missouri River.</i>						
Fort Buford, N. Dak.	21.0	5	5.5	11, 13, 14	3.1	2.4
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.5					
La Crosse, Wis.	13.0					
Dubuque, Iowa	16.0					
Davenport, Iowa	15.0	1	2.4	12	0.2	3.2
Keokuk, Iowa	14.0	1, 2, 3	2.1	13	0.6	2.7
Saint Louis, Mo.	32.0	1	6.8	30, 31	2.8	4.0
Cairo, Ill.	40.0	31	19.6	25	8.7	10.9
Memphis, Tenn.	34.6	1	16.3	26, 27	7.2	9.1
Vicksburg, Miss.	41.0	1	26.5	30	10.7	15.8
New Orleans, La.	13.0	4, 5	8.3	31	4.3	4.0
<i>Ohio River.</i>						
Pittsburgh, Pa.	22.0	24	10.8	16, 17	3.0	7.8
Parkersburg, W. Va.	38.0	25	16.2	3, 19	6.2	10.0
Cincinnati, Ohio	50.0	29	31.5	5, 6, 7	12.3	19.2
Louisville, Ky.	25.0	30	12.8	6, 7	6.4	6.4
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	31	24.4	5	3.2	21.2
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	29	12.9	3, 4, 5	2.3	10.6
Knoxville, Tenn.		26	6.4	3	0.4	6.0
<i>Monongahela River.</i>						
Pittsburgh, Pa.	29.0	24	10.8	16, 17	3.0	7.8
<i>Savannah River.</i>						
Augusta, Ga.	32.0	9	15.4	3	6.7	8.7
<i>Willamette River.</i>						
Portland, Oregon.	15.0	16, 17	3.1	8	2.2	5.3

*Frozen.

ATMOSPHERIC ELECTRICITY.

AURORAS.

Auroras were reported as follows: 3d, Saint Vincent, Minn. 4th, Carson, Iowa. 11th, Vevay, Ind. 14th, Webster, S. Dak. 29th, Appleton City, Mo. 30th, Seymour, Ind.

On the 3d, at Saint Vincent, Minn., a distinct auroral arch, about 8° in altitude and extending from 165° to 215° of azimuth, was observed from 8.40 to 11.30 p. m., 75th meridian time. The arch was about 1° in width and of a whitish color.

THUNDER-STORMS.

Thunder-storms were reported as follows: east of the Rocky Mountains thunder-storms were reported in the greatest number of states, 8, on the 3d; in 7 on the 6th and 31st; in 6 on the 7th; in 5 on the 5th; in 2 on the 8th, 24th, and 25th; and in 1 on the 4th, 18th, and 26th. On dates other than those named no thunder-storms were reported.

East of the Rocky Mountains thunder-storms were reported on the greatest number of dates, 5, in La. and Miss.; on 4 in N. C., Tenn., and Tex.; on 3 in Ala., Fla., Ga., and S. C.; on

2 in Ark.; and on 1 in Ill., Iowa, Kans., Ky., Mo., and N. H. West of the Rocky Mountains thunder-storms were reported as follows: Ariz., 5th, 30th, and 31st; Cal., 3d; Nev., 29th

and 30th; Oregon, 14th and 19th; Utah, 30th; Wash., 13th and 18th. In states and territories other than those named no thunder-storms were reported.

MISCELLANEOUS PHENOMENA.

DROUGHT.

Drought prevailed in parts of Illinois, Iowa, Missouri, Louisiana, Texas, and Montana. At Philo, Ill., only 0.13 inch of rain had fallen from November 16th to December 31st, and water was very scarce. At Fort Madison, Iowa, the month was very dry. At Cedar Rapids, Iowa, the monthly precipitation was the smallest for December during the last 5 years; the river was quite low, and streams and wells were becoming dry. At Oregon, Mo., water was failing in streams and springs. At Hannibal, Mo., it was the driest month of the year, and the river was reported lower than at any time in 50 years. At Shelby, Mo., no precipitation fell from November 16th until December 31st, and wells and stock ponds were unusually low. The drought that prevailed in north Louisiana from November 16th was broken on the 5th, and in south Louisiana on the 3d. Near San Antonio, Tex., scarcity of water on the ranges caused large loss of live stock; the drought was broken on the 23d. Near Fort Custer, Mont., many streams were dried up, and stock was suffering for water.

MIRAGE.

On the 14th, at Saint Vincent, Minn., the Pembina Mountains, 50 miles distant, and Hamilton, N. Dak., 22 miles distant, were in full view at 8 a. m., 75th meridian time. At this time a remarkably fine mirage was observed. Objects, large and small, were plainly brought to view. Smoke from chimneys many miles away could be distinctly seen, and cattle in a farm-yard, 8 miles distant, were plainly visible. The phenomenon lasted from daybreak until 9.45 a. m. On the 20th a mirage was observed at Ship Island Light-house, Miss., between 3 and 4 p. m., Biloxi, Miss., and vessels and bathing-houses being clearly seen.

SUN SPOTS.

Mr. D. E. Hadden, Alta, Iowa: 3d, 1 group, 1 spot; large spot on nw. limb, disappearing by solar rotation. 7th, small faculae on nw. limb; faint groups faculae near e. and sw. limbs. 12th, small faculae near e. limb. 14th, 2 groups, 10 spots; larger groups s. latitude on meridian; other group e. one-fourth across disc; small faculae near se. limb. 15th, 3 groups, 14 spots, definition poor. 16th, 2 groups, definition poor. 17th, 1 group, definition poor. 18th, 2 groups, 8 spots; large group of 5 spots near sw. limb, surrounded by faculae; the other group 1 day east of meridian. 19th, 2 groups, 10 spots; new spots in group on meridian. 20th, 3 groups, 5 spots; 1 group on w. limb, disappearing by solar rotation, had brilliant faculae, but spots could not be seen; new group on e. limb with large areas of faculae. 21st, group which was near meridian n. latitude 20th had disappeared, and the group visible

on e. limb 20th could not be seen; small faculae e. 23d, faculae w. and sw. 26th, 1 group, 2 spots; new group n. latitude 1 day e. of meridian. 27th, 1 group, 1 spot; spot on meridian vanishing. 28th, small faculae by rotation on e. limb. 29th, 1 group, 1 spot; new group in faculae near e. limb; faculae nw. Cloudy 1st, 2d, 4th, 5th, 13th, 24th, and 31st.

Mr. C. E. Buzzell, Leaf River, Ill.: 1st, the large disturbance of November 21st was passing w. limb. 2d to 7th, cloudy. 8th, marked faculae and small spots near w. limb. 9th to 12th, poor definition. 13th, poor definition; 1 group, 2 days in, in n. latitude; 1 group, 5 days in, in s. latitude; both unchanged on 14th. 15th and 16th, cloudy. 18th, 1 new group near meridian; 1 group near w. limb, which faded out on 19th. Group of 18th subsided on 20th, with apparent clear disc on 21st. 25th, 2 small groups in n. latitude near meridian; faded out on 28th. 29th, new group, 3 days in, in n. latitude; faded out on 30th. 31st, cloudy.

Mr. John W. James, Riley, Ill.: the large spot on the sun's meridian November 28th disappeared by solar rotation 4th, but failed to reappear when due on e. edge. 4th to 13th, none seen. 14th, a group of 12 small spots on sun's meridian in very low s. latitude; still seen 18th. 21st, faculae near e. limb. 21st to 28th, no spots seen. 29th, 1 small spot, surrounded by faculae, 2 days from e. edge; spot gone on 30th.

Mr. H. D. Govey, North Lewisburgh, Ohio: sun spots were observed on the 2d, 14th, 15th, 18th, and 19th.

Haverford College Observatory, Pa. (observed by Prof. F. P. Leavenworth):

Date.	Number of new		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Faculae.	Remarks.
	Groups.	Spots.	Groups.	Spots.	Groups.	Spots.	Groups.	Spots.		
Dec., 1890.										
1, 10 a. m.	1	1	0	0	0	0	3	13	2	Definition fair; 2 large spots.
2, 11 a. m.	0	0	0	0	0	0	2	8	1	Definition good; 1 large spot.
4, 11 a. m.	0	0	1	3	0	0	0	0	2	Definition fair.
9, 2 p. m.	1	4	0	0	0	0	1	4	1	Definition good.
10, 10 a. m.	1	3	1	4	0	0	1	3	1	Definition good; spots small.
11, 11 a. m.	0	0	0	0	0	0	1	2	1	Definition good; spots small.
12, 11 a. m.	0	0	0	0	0	0	0	0	0	Definition poor.
13, 11 a. m.	2	15	0	0	0	0	2	15	2	Definition fair.
14, 12 m.	0	17	0	0	0	0	2	32	1	Definition fair.
15, 9 a. m.	0	0	0	0	0	0	2	32	3	Definition fair.
15, 3 p. m.	0	0	0	0	0	0	2	21	0	Definition bad.
19, 10 a. m.	1	1	0	0	1	1?	3	24	3	Definition poor; 1 large spot.
20, 1 p. m.	0	19	0	0	0	0	3	31	3	Definition good.
22, 10 a. m.	0	0	1	4	0	0	0	0	1	Definition fair.
23, 10 a. m.	1	2	0	0	0	0	1	2	3	Definition poor.
24, 10 a. m.	0	4	0	0	0	0	1	6	2	Definition poor.

VERIFICATIONS.

[Verifications made by Assistant Professor C. F. Marvin, assisted by Mr. H. E. Williams, chief clerk of the Forecast Division.]

FORECASTS FOR 48 AND 72 HOURS IN ADVANCE.

Appreciating the great importance that long time predictions possess for the general public the Chief Signal Officer has authorized forecasts for 48 and 72 hours, covering the 2d and 3d days in advance. These are optional with the forecast official, and are only made when clearly in the public interest, and cover, in all cases, considerable areas of country, and are not confined to localities.

Percentages of verifications of forecasts made for second day in advance. Number of predictions made: weather, 243; temperature, 158. Percentages of verifications: weather, 84.1; temperature, 94.4; weather and temperature combined, 87.5.

Percentages of verifications of forecasts made for third day in advance. Number of predictions made: weather, 25. Percentage of verifications: weather, 96.

FORECASTS FOR 24 HOURS IN ADVANCE.

The forecasts for districts east of the Rocky Mountains for December, 1890, were made by Captain James Allen, 3d Cav.

alry, Signal Officer, and those for the Pacific coast districts were made at San Francisco, Cal., by 2d Lieutenant John P. Finley, Signal Corps.

Percentages of forecasts verified, December, 1890.

States.		States.	
Maine.....	81.9	Kentucky.....	84.6
New Hampshire.....	84.2	Ohio.....	81.4
Vermont.....	86.1	West Virginia.....	85.4
Massachusetts.....	79.9	Indiana.....	79.2
Rhode Island.....	83.2	Illinois.....	88.4
Connecticut.....	83.2	Lower Michigan.....	74.9
Eastern New York.....	84.8	Upper Michigan.....	72.6
Western New York.....	74.3	Wisconsin.....	84.4
Eastern Pennsylvania.....	83.8	Minnesota.....	88.8
Western Pennsylvania.....	79.4	Iowa.....	86.6
New Jersey.....	85.3	Kansas.....	86.1
Delaware.....	87.0	Nebraska.....	82.8
Maryland.....	86.7	Missouri.....	84.5
District of Columbia.....	85.7	Colorado.....	84.3
Virginia.....	85.5	North Dakota.....	86.6
North Carolina.....	84.3	South Dakota.....	85.0
South Carolina.....	85.4	Southern California*.....	90.9
Georgia.....	81.9	Northern California*.....	89.1
Eastern Florida.....	85.2	Oregon*.....	86.8
Western Florida.....	84.1	Washington*.....	85.0
Alabama.....	91.4	By elements: Weather.....	85.7
Mississippi.....	91.5	Temperature.....	81.2
Louisiana.....	89.7	Monthly percentage of weather and	
Texas.....	89.8	temperature combined.....	83.9
Arkansas.....	79.5		
Tennessee.....	82.2		

* In determining the monthly percentage of weather and temperature combined, the Pacific coast states are not included. † The forecasts of temperature in districts east of the Rocky Mountains for December, 1890, were made with reference to the maximum temperature alone; that is, a prediction of warmer or cooler indicated that the maximum temperature of the day designated would be higher or lower than the maximum of the previous day. ‡ The monthly percentage of weather and temperature combined is determined by multiplying the percentage of weather by 6, and the percentage of temperature by 4, and dividing their sum by 10.

WIND SIGNALS FOR DECEMBER, 1890.

Statement showing percentages of justifications of wind signals for the month of December, 1890:

Wind signals.—(Ordered by Captain James Allen.) Total number of signals ordered, 95; justified as to velocity, wholly, 70, partly, 12; justified as to direction, 93. Of the signals ordered 49 were cautionary, of which 33 were wholly and 7 partly justified; and 46 were storm signals, of which 37 were wholly and 5 partly justified. 20 signals were ordered for easterly winds, of which 18 were justified, and 75 were ordered for westerly winds, all of which were justified. Percentage of justifications, 77.5.

COLD-WAVE SIGNALS AND TEMPERATURE-FALL WARNINGS.

[Ordered by Assistant Professor T. Russell.]

Number of cold-wave signals ordered, 156; justified, 102. Percentage of justifications, 65.4. Number of temperature-fall warnings, 119. Percentage of justifications, 61.3. Percentage of justifications of cold-wave signals and temperature-fall warnings combined, 64.3.

Percentages of verifications of weather and temperature signals reported by directors of the various State Weather Services for December, 1890.

States.	Weather.	Tem- perature.	States.	Weather.	Tem- perature.
Iowa.....	92	93	Nebraska.....	87	86
Illinois.....	87	85	New Jersey.....	83	87
Michigan.....	88	88	North and South Dakota....	82	82
Minnesota.....	79	85	Ohio.....	88	88
Missouri.....	84	85	Pennsylvania.....	82	84

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for December, 1890, of the directors of the various state weather services:

ALABAMA.

Temperature.—Maximum, 91, at Brewton, 5th; minimum, 20, at Valley Head, 4th, 28th, and 29th, and at Citronelle, 9th; greatest monthly range, 68, at Brewton; least monthly range, 39, at Chattanooga, Tenn.

Precipitation.—Greatest monthly, 3.97, at Double Springs; least monthly, 1.35, at Bermuda.

Wind.—Prevailing direction, northwest.—Prof. P. H. Mell, Auburn, director; J. M. Quarles, Private, Signal Corps, assistant.

ARKANSAS.

Temperature.—The mean was 2.1 above the normal; maximum, 78, at Texarkana, 24th; minimum, 2, at Lead Hill, 9th; greatest monthly range, 74, at Lead Hill; least monthly range, 44, at Conway and Dallas.

Precipitation.—The average was about 1.26 below the normal; greatest monthly, 5.12, at Winslow; least monthly, 1.70, at Texarkana.

Wind.—Prevailing direction, north.—M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Sergeant, Signal Corps, assistant.

COLORADO.

Temperature.—Maximum, 87, at Bennet, 10th; minimum, —21, at Breckenridge, 8th; greatest monthly range, 93, at Breckenridge; least monthly range, 30, at Monte Vista.

Precipitation.—Greatest monthly, 5.40, at Cumbres; least monthly, 0.00, at several stations.—W. S. Miller, Sergeant, Signal Corps, Denver, assistant.

ILLINOIS.

Temperature.—The mean was 3.0 above the normal; maximum, 63, at Cairo, 1st; minimum, —2, at Aurora, Belvidere, and Sycamore, 4th.

Precipitation.—The average was 1.78 below the normal; greatest monthly, 2.91, at Cairo; least monthly, 0.03, at Keokuk, Iowa.

Wind.—Prevailing direction, northwest.—John Craig, Sergeant, Signal Corps, Springfield, in charge.

INDIANA.

Temperature.—Maximum, 59, at Jeffersonville, 21st; minimum, 2, at Maury and Point Isabel, 28th; greatest monthly range, 52, at Princeton and Worthington; least monthly range, 32, at Columbia City.

Precipitation.—Greatest monthly, 3.86, at Cannelton; least monthly, 0.23, at La Fayette.

Wind.—Prevailing direction, southwest.—Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Sergeant, Signal Corps, assistant.

IOWA WEATHER AND CROP SERVICE.

Temperature.—The mean was 6.5 above the normal; maximum, 72, at Glenwood, 10th; minimum, —18, at West Bend, 8th; greatest monthly range, 80, at Eagle Grove; least monthly range, 42, at Fort Madison.

Precipitation.—The average was about 1.00 below the normal; greatest monthly, 1.40, at West Bend; least monthly, 0.00, at Logan and Glenwood.

Wind.—Prevailing direction, northwest.—J. R. Sage, Des Moines, director; G. M. Chappel, Sergeant, Signal Corps, assistant.

KANSAS.

Temperature.—The mean was about 5.0 above the normal; maximum, 82, at Horton, 22d; minimum, —3, at Lakin, 7th; greatest monthly range, 74, at Horton; least monthly range, 48, at Morse.

Precipitation.—The average was 0.52 below the normal; greatest monthly, 2.00, at Oswego; least monthly, 0.00, at several stations.

Wind.—Prevailing direction, southwest.—Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Sergeant, Signal Corps, assistant.

KENTUCKY.

Temperature.—The mean was less than 1 above the normal; maximum, 70, at Earlington, 1st; minimum, 12, at Shelbyville and Richmond, 28th; greatest monthly range, 50, at Frankfort and Princeton; least monthly range, 38, at Central City and Franklin.

Precipitation.—The average was about 1.00 below the normal; greatest monthly, 4.27, at Franklin; least monthly, 2.14, at Mount Sterling.

Wind.—Prevailing direction, southwest.—Dr. E. A. Grant, Louisville, director; Frank Burke, Sergeant, Signal Corps, assistant.

LOUISIANA.

Temperature.—Maximum, 82, at Melville, 7th, and at Plaquemine, Cameron, and Thibodeaux, 6th; minimum, 21, at Liberty Hill, 9th; greatest monthly range, 58, at Plaquemine; least monthly range, 37, at Port Eads.

Precipitation.—Greatest monthly, 6.08, at Amite City; least monthly, 1.07, at New Iberia.

Wind.—Prevailing direction, north.—George E. Hunt, Sergeant, Signal Corps, New Orleans, in charge.

MICHIGAN.

Temperature.—The mean was 1.6 below the normal of the last 15 years; maximum, 55, at Hanover 1st, and at Grape, 10th; minimum, —17, at Hillman, 7th; greatest monthly range, 62, at Hillman; least monthly range, 28, at Colon.

Precipitation.—The average was 1.38 below the normal of the last 15 years; greatest monthly, 3.80, at Charlevoix; least monthly, 0.52, at West Branch.
Wind.—Prevailing direction, northwest.—*N. B. Conger, Sergeant, Signal Corps, Lansing, director.*

MINNESOTA.

Temperature.—Maximum, 55, at Mankato, 22d; minimum, -27, at Saint Vincent and Pokegama Falls, 2d; greatest monthly range, 79, at Saint Vincent; least monthly range, 46, at Farmington and Grand Meadow.

Precipitation.—Greatest monthly, 0.53, at Rolling Green; least monthly, 0.05, at Crookston and Moorhead.

Wind.—Prevailing direction, northwest.—*John Healy, Corporal, Signal Corps, Minneapolis, in charge.*

MISSISSIPPI.

Temperature.—The mean was 2.9 above the normal; maximum, 81, at Vaiden, 5th; minimum, 19, at Louisville, 28th; greatest monthly range, 60, at Vaiden; least monthly range, 42, at Rienzi.

Precipitation.—The average was 1.99 below the normal; greatest monthly, 6.30, at Bay Saint Louis; least monthly, 1.75, at Moss Point.—*R. B. Fulton, Signal Corps, University, director.*

METEOROLOGICAL REPORT OF THE MISSOURI STATE BOARD OF AGRICULTURE.

Temperature.—The mean was about 7.0 above the normal; maximum, 76, at Protem, 1st; minimum, -3, at Cassville, 8th; greatest monthly range, 74, at Protem; least monthly range, 40, at Austin.

Precipitation.—The average varied from about normal in the southern portion to about 2.00 below in the northern portion; greatest monthly, 2.91, at Cairo, Ill.; least monthly, trace, at Conception and Pickering.—*Levi Chubbuck, Secretary of State Board of Agriculture, Columbia, director; A. L. McRae, Sergeant, Signal Corps, assistant.*

NEBRASKA.

Temperature.—Maximum, 82, at Weeping Water; minimum, -6, at West Point.

Precipitation.—In the central part of the state no precipitation or only a trace fell, and it did not exceed 0.50, except at Kimball and Franklin.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Sergeant, Signal Corps, assistant.*

NEVADA.

Temperature.—The mean was 0.5 below the normal; maximum, 73, at El Dorado Canyon, 2d; minimum, 0, at Pioche, 8th; greatest monthly range, 60, at Ely; least monthly range, 27, at Candelaria.

Precipitation.—The average was 1.21 below the normal; greatest monthly, 3.55, at Lewer's Ranch; least monthly, 0.16, at Eureka.

Wind.—Prevailing direction, southwest.—*Prof. Charles W. Friend, Carson City, director; D. C. Grunow, Corporal, Signal Corps, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

Temperature.—The mean was 6.3 below the normal; maximum, 58, at Plymouth, 21st; minimum, -36, at Orono, 31st; greatest monthly range, 83, at Orono; least monthly range, 40, at Northampton.

Precipitation.—The average was 0.56 above the normal; greatest monthly, 6.16, at Kingston; least monthly, 1.75, at New Hartford.

Wind.—Prevailing direction, northwest.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; J. Warren Smith, Private, Signal Corps, assistant.*

NEW JERSEY.

Temperature.—The mean was 1.6 below the normal; maximum, 56, at Bridgeton, 23d; minimum, 3, at Tenafly, 30th; greatest monthly range, 46, at Tenafly; least monthly range, 30, at Ocean City.

Precipitation.—The average was 0.27 above the normal; greatest monthly, 5.74, at Oceanic; least monthly, 2.34, at Lambertville.

Wind.—Prevailing direction, northwest.—*E. W. McGann, Sergeant, Signal Corps, New Brunswick, in charge.*

NEW YORK.

Temperature.—Maximum, 54, at New York City, 3d, and at Setauket, 4th; minimum, -19, at Ampersand, 3d and 20th; greatest monthly range, 59, at Madison Barracks; least monthly range, 31, at Arkwright.

Precipitation.—Greatest monthly, 6.74, at Turin; least monthly, 0.58, at Fort Niagara.

Wind.—Prevailing direction, northwest.—*Prof. E. A. Fuertes, Dean of the College of Civil Engineering, Cornell University, Ithaca, director; R. M. Hardinge, Private, Signal Corps, assistant.*

NORTH CAROLINA.

Temperature.—The mean was 1.5 above the normal; maximum, 74, at Wilmington, 7th; minimum, 10, at Franklin, 14th; greatest monthly range, 56, at Franklin; least monthly range, 13, at Hatteras.

Precipitation.—The average was 1.26 below the normal; greatest monthly, 6.01, at Hatteras and Norfolk, Va.; least monthly, 0.61, at Wilmington.

Wind.—Prevailing direction, northwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Sergeant, Signal Corps, assistant.*

NORTH AND SOUTH DAKOTA.

Temperature.—The mean was about 9.0 above the normal; maximum, 75,

at Rapid City, S. Dak., 10th; minimum, -25, at Grand Forks, N. Dak., 2d; greatest monthly range, 78, at Woonsocket, S. Dak.; least monthly range, 55, at De Smet, S. Dak.

Precipitation.—The average was about 0.26 below the normal; greatest monthly, 2.28, at Webster, S. Dak.; least monthly, 0.04, at Fort Buford, N. Dak.

Wind.—Prevailing direction, northwest.—*S. W. Glenn, Sergeant, Signal Corps, Huron, S. Dak., in charge.*

OHIO.

Temperature.—The mean was 0.9 below the average; maximum, 65, at Portsmouth, 11th; minimum, 3, at Newcomerstown, 30th.

Precipitation.—The average was 0.21 deficient; it was 0.13 in excess in the southern section; monthly snowfalls averaged between 10 and 20 inches in the different sections; the greatest in 24 consecutive hours occurred on the 25th and 26th, when from 6 to 10 inches fell in the southern, central, and eastern portions of the state.—*Prof. B. F. Thomas, Columbus, director; C. M. Strong, Sergeant, Signal Corps, secretary and assistant.*

OREGON.

The characteristics of the month were the excess in temperature and the deficiency in precipitation.

Temperature.—The mean was 2.4 above the normal; maximum, 67, at Grant's Pass, 26th; minimum, 0, at Burns, 11th.

Precipitation.—The average was 3.20 below the normal; greatest monthly, 8.81, at Astoria; least monthly, trace, at Silver Falls.

Wind.—Prevailing direction, south.—*Hon. H. E. Hayes, Master State Grange, Oswego, director; B. S. Pague, Sergeant, Signal Corps, assistant.*

PENNSYLVANIA.

Temperature.—The mean was 2 above the normal; maximum, 50, at Charlesville, 11th; minimum, 11, at Dyberry, 29th; greatest monthly range, 25, at Wilkes Barre; least monthly range, 11, at Grampian Hills.

Precipitation.—The average was 1.00 above the normal; greatest monthly, 9.68, at Blue Knob; least monthly, 1.72, at Erie.

Wind.—Prevailing direction, northwest.—*Under direction of the Franklin Institute, Philadelphia; T. F. Townsend, Sergeant, Signal Corps, assistant.*

TENNESSEE.

Temperature.—The mean was normal; maximum, 76, at Lynnville, 2d; minimum, 14, at Rugby; greatest monthly range, 54, at Hohenwald; least monthly range, 34, at Rogersville.

Precipitation.—The average was nearly 1.00 above the normal; greatest monthly, 6.08, at Carthage; least monthly, 2.11, at Fayetteville.

Wind.—Prevailing direction, northwest.—*J. D. Plunket, M. D., Nashville, director; H. C. Bate, Signal Corps, assistant.*

TEXAS.

Temperature.—Maximum, 89, at College Station, 5th; minimum, 10, at Coldwater, 7th.

Precipitation.—Greatest monthly, 4.35, at Longview; least monthly, 0.00, at Durham and Epworth.—*D. D. Bryan, Galveston, director; I. M. Cline, Sergeant, Signal Corps, assistant.*

WISCONSIN.

Temperature.—The mean was 3 above the normal; maximum, 58, at Oshkosh, 10th; minimum, -16, at Hayward, 4th.

Precipitation.—The average was nearly 1.00 below the normal; greatest monthly, 2.16, at Delevan; least monthly, 0.10, at Saint Paul, Minn.

Wind.—Prevailing direction, west.—*R. E. Kerkam, Milwaukee, Sergeant, Signal Corps, in charge.*

Meteorological record of Army post surgeons, voluntary, and other co operating observers, December, 1890.

Stations.	Temperature. (Fahrenheit.)			Precip'n.		Stations.	Temperature. (Fahrenheit.)			Precip'n.	
	Max.	Min.	Mean.				Max.	Min.	Mean.		
Alabama.	0	0	0	Ins.		Arizona—Cont'd.	0	0	0	Ins.	
Bermuda *.....	76	24	52.0	1.35		Ash Canyon.....	68	19	47.1	3.78	
Bessemer.....	65	24	47.0	1.58		Benson.....	68	34	52.4	1.48	
Brewton.....	91	23	58.2	1.70		Bisbee *.....	70	32	48.3	1.99	
Citronelle.....	80	29	55.8	1.71		Calabasas.....	.....	.....	.....	1.85	
Columbiana *.....	69	23	47.9	1.91		Casa Grande.....	87	45	62.3	0.87	
Decatur (1) *.....	.....	.....	.....	2.47		Chino.....	74	22	45.3	.....
Double Springs *.....	69	21	47.3	3.97		Chiri Cahua M's.....	.....	.....	.....	2.90	
Gadsden.....	.....	.....	.....	4.46		Dragoon *.....	.....	.....	.....	2.01	
Greensborough.....	69	28	48.3	3.37		Dragoon Summit.....	78	32	55.4	0.18	
Livingston (1) *.....	72	24	50.7	1.59		Dos Cabezas *.....	.....	.....	.....	2.31	
Mountain Home.....	73	17	43.1	3.16		Dudleyville.....	.....	.....	.....	1.67	
Mount Willing.....	71	31	49.5	1.50		Eagle Pass.....	.....	.....	.....	2.10	
Mt. Vernon B'ks.....	78	23	52.3	1.58		Farley's Camp.....	.....	.....	.....	4.44	
Talladega.....	.....	.....	.....	2.20		Fort Apache.....	66	21	43.2	1.52	
Tuscaloosa.....	.....	.....	.....	1.84		Fort Bowie.....	61	24	46.1	2.45	
Tuscumbia (1).....	73	23	45.7	3.61		Fort Grant.....	67	30	48.6	2.01	
Uniontown.....	74	25	52.3	2.47		Fort Huachuca.....	67	27	47.6	2.70	
Valley Head *.....	68	20	42.4	3.84		Fort Lowell.....	82	25	60.6	1.48	
Alaska.						Gila Bend (1) *.....	88	52	60.7	1.10	
Juneau.....	45	10	29.0	6.86		Gila Bend (2).....	82	50	63.6	1.42	
Killsnoo.....	45	16	31.3	3.00		Grand Central Mill.....	.....	.....	.....	1.01	
Arizona.						Holbrook *.....	39	19	38.0	1.82	
Antelope Valley.....	.....	.....	.....	4.34		Lochiel *.....	67	30	47.4	3.45	
Ariz. Canal Co. Dam.....	76	37	57.7	1.71		Maricopa.....	72	40	53.2	2.47	

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Arizona—Cont'd.</i>	o	o	o	Ins.	<i>California—Cont'd.</i>	o	o	o	Ins.
Mineral Park.....	76	39	54.3	4.30	Georgetown.....	66	29	47.4	7.65
Natural Bridge.....	76	39	54.3	4.30	Gilroy.....	66	30	48.2	3.84
New River.....	76	39	54.3	4.30	Girard.....	66	33	44.3	3.30
Oro.....	76	39	54.3	4.30	Glen Ellen.....	61	30	45.1	6.23
Pantano.....	73	37	54.0	1.54	Goshen.....	70	29	42.8	5.01
Payson.....	73	37	54.0	4.13	Grass Valley.....	60	35	45.5	2.65
Red Rock.....	78	23	51.7	2.63	Haywards.....	78	25	51.3	2.51
San Carlos.....	80	26	56.1	1.27	Hollister.....	64	18	37.4	1.90
San Simon.....	78	23	51.7	2.63	Hornbrook.....	64	18	37.4	1.90
Show Low.....	78	23	51.7	2.63	Hydesville.....	64	18	37.4	1.90
Simmons.....	78	23	51.7	2.63	Indio.....	66	25	45.6	3.49
Strawberry.....	78	23	51.7	2.63	Iowa Hill.....	67	33	48.6	2.25
Teviston.....	76	35	55.5	1.28	Julian.....	63	34	49.9	6.36
Texas Hill.....	76	35	55.5	1.28	Keeler.....	63	34	49.9	6.36
Tip Top.....	76	35	55.5	1.28	Keene.....	63	34	49.9	6.36
Tucson (1).....	72	35	53.6	1.33	Kingsburg.....	66	30	45.7	1.92
Tucson (2).....	72	35	53.6	1.33	King City.....	72	28	47.9	1.54
Walnut Grove.....	64	30	46.6	2.35	Knight's Landing.....	65	35	49.1	1.75
Whipple Barracks.....	69	28	47.5	0.00	Lathrop.....	79	33	48.7	7.52
Willcox.....	74	43	59.9	0.52	Lemoore.....	70	32	46.0	1.47
Wood Canyon.....	74	43	59.9	0.52	Livermore.....	73	34	52.9	3.31
Woodruff.....	74	43	59.9	0.52	Long Beach.....	80	41	57.4	0.00
<i>Arkansas.</i>					Los Angeles.....	83	42	60.2	2.82
Arkansas City.....	74	23	48.0	3.78	Los Banos (2).....	69	34	46.3	1.32
Camden.....	74	23	48.0	3.78	Los Gatos (1).....	72	32	49.8	4.07
Conway.....	70	20	44.7	2.63	Los Gatos (2).....	62	33	46.6	4.74
Dallas.....	64	20	44.3	3.20	Mammoth Tank.....	78	40	59.0	0.54
Dardanelle.....	74	18	44.5	4.25	Martinez.....	62	30	43.0	2.72
Davall's Bluff.....	68	12	42.9	2.13	Milton (near).....	56	32	44.0	2.63
Fayetteville.....	73	32	50.6	3.44	Marysville.....	50	35	50.9	2.61
Forrest City.....	73	32	50.6	3.44	Menlo Park.....	67	32	48.6	2.62
Fulton.....	67	20	42.4	4.46	Modesto.....	72	37	47.6	2.14
Harrisburgh.....	67	20	42.4	4.46	Mojave.....	74	30	47.5	0.67
Helena (1).....	72	14	44.3	3.73	Monson.....	68	33	44.4	2.66
Helena (2).....	69	21	44.2	2.61	Montague.....	56	30	40.1	1.40
Hot Springs.....	70	2	41.7	2.15	Monterey.....	66	32	52.5	2.66
Lead Hill.....	70	2	41.7	2.15	Monterey (Hotel	69	25	53.1	0.00
Lead Hill.....	70	2	41.7	2.15	del Monte).....	62	30	47.3	3.41
Lonoke.....	70	23	49.1	2.75	Napa.....	62	30	47.3	3.41
Mount Nobo.....	76	21	49.3	1.91	National City.....	85	40	60.7	2.43
Newport (1).....	67	15	42.4	3.55	Newark.....	66	35	50.3	2.55
Newport (2).....	67	15	42.4	3.55	Newhall.....	78	32	53.8	1.94
Ocala.....	70	20	44.4	4.71	Newman.....	67	36	48.0	1.17
Ozone.....	66	19	42.5	3.10	Niles.....	73	28	50.5	2.01
Pine Bluff.....	72	22	45.3	2.88	Norwalk.....	80	40	60.5	2.01
Russellville.....	72	22	45.3	2.88	Oakland (1).....	69	33	49.5	3.91
Stuttgart.....	72	22	45.3	2.88	Oakland (2).....	62	34	53.2	2.96
Texas.....	78	23	50.8	1.70	Ogilby.....	84	43	61.5	0.31
Winslow.....	70	10	42.0	5.12	Ontario.....	80	35	60.4	2.00
<i>California.</i>					Orland.....	73	30	47.4	2.46
Alameda.....	65	30	45.1	1.52	Oroville.....	70	30	47.9	4.61
Alcatraz Island.....	61	26	47.4	1.11	Pajaro.....	76	38	54.0	3.54
Almaden.....	67	35	50.4	2.92	Paso Robles.....	70	26	46.2	3.34
Anaheim.....	79	40	60.2	3.36	Petaluma.....	70	34	46.2	3.08
Anderson.....	65	27	48.8	4.15	Placerville (1).....	64	30	45.5	7.54
Angel Island.....	70	35	47.7	1.00	Placerville (2).....	61	26	42.5	6.89
Antioch.....	68	36	49.4	1.52	Pleasanton.....	65	31	46.0	2.77
Aptos.....	70	33	54.4	2.93	Pomona.....	68	39	59.8	2.27
Athlone.....	73	34	46.9	1.97	Porterville.....	76	32	47.9	2.78
Auburn.....	60	35	47.1	5.13	Puente.....	78	42	57.4	0.00
Bakersfield.....	71	32	48.0	1.34	Ravenna.....	68	36	52.8	0.00
Barstow.....	74	28	48.8	0.52	Red Bluff.....	76	34	51.0	2.04
Beaumont.....	74	40	54.8	2.74	Redding.....	65	33	48.1	3.56
Belmont.....	65	32	48.4	0.00	Riverside.....	78	34	54.0	3.07
Benicia Barracks.....	63	33	43.6	3.35	Rocklin.....	62	34	46.5	3.78
Berendo.....	66	35	46.0	2.83	Rumsey.....	67	30	46.4	3.91
Berkley.....	66	34	48.1	3.32	Sacramento (1).....	58	28	39.9	3.72
Bishop Creek.....	60	23	40.1	1.00	Sacramento (2).....	60	36	45.4	2.64
Boca.....	60	0	36.9	3.65	Salinas (1).....	72	35	49.0	2.05
Borden.....	75	35	48.9	2.40	Salinas (2).....	62	40	49.3	2.26
Boulder Creek.....	74	25	44.4	9.45	Salton.....	80	40	58.2	0.32
Brentwood.....	61	31	45.8	1.56	Sanger Junction.....	73	32	46.0	2.37
Brighton.....	76	35	45.3	3.03	San Ardo.....	78	33	48.6	1.41
Caliente.....	70	30	46.9	4.30	San Diego B'ks.....	80	43	60.5	1.64
Calistoga.....	74	27	48.1	4.85	San Gabriel.....	84	44	58.1	1.68
Castroville.....	72	40	55.5	2.08	San Jose.....	70	35	48.6	2.40
Centerville.....	65	36	51.8	3.05	San Mateo.....	62	34	47.1	2.86
Chico.....	70	33	45.5	3.24	San Pedro.....	80	46	62.1	1.01
Ciaco.....	48	20	32.2	7.90	Santa Ana.....	86	36	60.4	2.35
Colfax.....	70	33	45.3	4.34	Santa Barbara (1).....	76	44	58.4	3.53
Colton.....	86	34	57.0	2.45	Santa Barbara (2).....	69	36	55.3	3.02
Corning.....	74	39	47.7	2.26	Santa Clara.....	62	33	47.5	2.07
Crescent City.....	72	35	48.9	9.66	Santa Cruz (1).....	76	36	53.1	2.34
Davisville.....	72	35	48.9	9.66	Santa Cruz (2).....	68	34	51.5	2.78
Delano.....	68	32	47.9	1.31	Santa Margarita.....	70	23	43.2	5.68
Delta.....	60	30	45.0	3.18	Santa Maria.....	76	33	52.3	3.40
Dunsmuir.....	56	30	43.0	8.05	Santa Monica.....	78	43	58.6	2.81
Dunsmuir.....	56	30	43.0	8.05	Santa Paula.....	80	45	64.0	2.53
El Dorado.....	69	31	48.0	5.48	Santa Rosa.....	62	31	46.6	3.93
Elmira.....	75	32	47.1	3.74	Selma.....	61	34	44.2	1.89
El Vano.....	63	32	45.7	5.19	Seven Palms.....	82	43	59.9	0.50
Emigrant Gap.....	54	28	36.1	6.20	Shingle Springs.....	70	33	49.0	5.40
Espartero.....	64	28	45.3	2.85	Sims.....	67	20	43.7	8.80
Evergreen.....	68	34	45.9	1.96	Sisson.....	58	20	35.4	3.18
Farmington.....	76	27	50.5	6.35	Soledad.....	74	30	50.3	1.94
Felton.....	76	27	50.5	6.35	Sonoma.....	62	32	45.8	3.73
Fernando.....	79	42	55.9	1.61	Soquel.....	70	35	55.2	0.00
Florence.....	87	40	45.2	4.25	South Vallejo.....	62	32	43.3	3.16
Folsom.....	75	30	48.3	7.19	Spadra.....	82	38	56.6	2.00
Fort Gaston.....	54	36	47.9	3.48	Steeles.....	71	41	55.0	3.45
Fort Mason.....	66	32	45.8	2.11	Summit.....	49	17	39.5	7.40
French.....	70	26	45.8	3.01					
Fruit.....	70	26	45.8	3.01					
Gait.....	70	26	45.8	3.01					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>California—Cont'd.</i>					<i>Idaho—Cont'd.</i>				
Suisun City.....	80	0	0	Ins.	Kootenai.....	55	0	0	Ins.
Susanville.....	62	12	34.2	2.81	Mullan.....	50	20	33.9	1.69
Tehachapi.....	60	29	41.9	3.48	Payette.....	54	15	34.8	3.98
Tehama.....	70	42	51.6	2.88	Placerville.....	54	8	19.8	4.22
Templeton.....	72	28	48.0	4.24	Ruthburg.....	59	13	32.4	12.7
Towles.....	60	22	42.6	7.80	<i>Rivers.</i>				
Tracy.....	66	33	44.3	1.83	Alton.....	51			00.74
Traver.....	64	33	46.3	2.85	Aurora (1).....	51	2	26.3	0.78
Tropic.....	88	40	54.4	3.13	Aurora (2).....	55	2	29.1	1.00
Truckee (1).....	42	0	26.7	3.70	Beardstown.....	58			0.00
Tulare.....	77	32	47.3	2.45	Beason.....	58	9	31.4	0.20
Turlock.....	66	32	47.2	1.64	Belvidere.....	52	2	27.1	1.25
Vacaville (1).....	68	32	44.7	4.14	Centralia.....	60	2	37.0	1.40
Vacaville (2).....	68	32	44.8	2.92	Charleston.....	56	6	31.9	0.13
Valley Springs.....	65	34	41.7	3.07	Cockrell.....	48	0	27.0	0.63
Vina.....	63	30	44.1	2.21	East Peoria.....	62	11	34.1	0.47
Volcano Springs.....	64	30	44.1	0.47	Fort Sheridan.....	51	0	33.4	2.27
Volta.....	64	30	44.1	0.47	Galeonda.....	62	18	37.8	1.37
Walla Walla Ck.....	52	16	36.2	3.85	Grand Tower.....	58			0.22
Walnut Creek.....	69	37	46.8	2.70	Greenville.....	59	7	33.2	1.64
Westley.....	66	30	50.0	1.75	Griggsville.....	56	18	33.4	0.28
Wheatland.....	61	30	42.2	2.19	Hennepin.....	54	7	28.4	0.20
Whittier.....	81	30	62.2	1.60	Irishtown.....	54			0.77
Williams.....	58	32	43.0	1.79	Jordan's Grove.....	60	3	33.6	1.59
Willow (1).....	67	28	43.7	3.14	Lacon.....	54	10	30.8	0.87
Willow (2).....	67	28	43.7	3.14	Lanark.....	52	0	25.0	0.81
Winters.....	68	32	46.9	3.71	Louisville.....	57	5	31.4	2.50
Woodland.....	79	33	50.6	2.35	Martinsville.....	57	0	32.1	1.34
<i>Colorado.</i>					Mascoutah.....	60	6	34.4	1.30
Fort Collins.....	63	6	34.0	0.12	Mattoon.....	55	15	37.4	1.00
Fort Lewis.....	50	—4	28.9	4.12	McLeanborough.....	58	18	36.3	1.38
Fort Logan.....	71	13	40.2	0.00	Mount Carmel.....	55			1.73
Fruita.....	52	10	30.7	0.73	Olney (1).....	59	12	35.0	1.60
Georgetown.....	50	14	33.0	0.00	Olney (2).....	59	8	33.3	2.16
Rocky Ford.....	70	6	35.8	0.00	Oswego.....	52	4	27.6	0.75
San Luis Ex. Sta.....	50	—4	25.6	T.	Ottawa.....	56	10	29.8	0.27
Smoky Hill Mine.....					Palestine.....	56	7	32.4	1.90
<i>Connecticut.</i>					Pana.....	61	15	34.89	1.12
Birmingham.....				3.80	Peoria (1).....	55			0.09
Canton.....	48	1	21.6	4.20	Peoria (2).....	60	16	33.8	0.41
Colchester.....	53	2	26.7	.....	Philo.....	56	5	31.5	0.30
Falls Village.....				4.45	Pontiac.....	56	6	31.9	0.30
Fort Trumbull.....	52	5	29.5	3.69	Quincy.....	51			1.05
Hartford (1).....	46	0	23.5	3.30	Riley.....	51	—1	25.6	1.13
Hartford (2).....				3.48	Rockford.....	51	0	27.2	1.60
Lake Konomoc.....				7.61	Rock Island Arsenal.....	58	4	30.2	1.20
Lebanon.....				4.63	Rushville.....	62	14	32.2	0.33
Mansfield.....	48	—2	23.4	4.21	Sandwich.....	60	4	29.8	0.25
Middletown.....	52	0	24.7	4.46	South Evanston.....	53	2		0.73
New Hartford (1).....	38	—2	18.2	3.64	Sycamore.....	51	—2	27.0	1.59
New Hartford (2).....				1.75	Warren.....	52	5	28.198	.....
Southampton.....	44	—5	23.9	4.14	Warsaw.....				T.
South Manchester.....				3.38	White Hall.....	60	6	36.0	0.43
Thompson.....	46	2	22.7	.....	Winnebago.....	50	0	25.8	1.40
Uncasville.....				5.76	<i>Indiana.</i>				
Voluntown.....	50	2	26.8	5.03	Angola.....	46	13	30.5	0.89
Wallingford.....				4.18	Buttleville.....		10	32.2	1.42
Waterbury.....	46	—3	22.4	5.21	Cannelton.....	56	18	33.9	3.86
West Simsbury.....				4.03	Columbia City.....	46	14	29.3	1.16
<i>Delaware.</i>					Columbus.....	56	6	31.6	1.59
Dover.....	55	18	34.2	4.00	Connerville.....	53	10	31.5	1.05
Kirkwood.....		20	30.4	.....	De Gonia Springs.....	56	18	37.1	2.13
<i>District of Columbia.</i>					Delphi.....	52	8	29.4	0.46
Washington B'ks.....	58	19	35.5	2.70	Evansville.....				1.57
<i>Florida.</i>					Farmland.....	50	10	32.8	1.90
Alva.....	86	37	59.6	0.54	Franklin.....	54	9	32.1	2.27
Duke.....	79	19	54.0	0.39	Huntington.....				0.33
Eustis.....	84	28	56.4	1.57	Jeffersonville.....	59	19	37.4	3.69
Fort Barrancas.....	73	27	57.4	2.22	La Fayette.....	53	6	31.6	0.46
Fort Meade.....	82	25	59.4	1.75	Logansport (1).....				0.46
Homeland.....	82	30	60.4	1.70	Logansport (2).....	52	14	32.0	0.59
Hypoluxo.....		48	64.1	1.34	Mausy.....	48	2	28.0	1.61
Merritt's Island.....	78	42	61.2	0.15	Mount Vernon (1).....				1.76
Ocala.....	81.8	32.4	54.40	0.95	Mount Vernon (2).....	58	16	34.3	1.76
Orange City.....	83	26	55.9	0.46	Muncie.....	52	11	34.3	1.70
St. Francis B'ks.....	79	36	59.9	0.60	Point Isabel.....	45	2	24.7	1.05
San Antonio.....	80	30	60.4	1.72	Princeton.....	55	3	33.7	2.35
Tallahassee.....	75	25	51.7	0.83	Rockville.....	55	7	33.8	0.87
Villa City.....	78	36	58.1	0.83	Rushville.....				1.33
<i>Georgia.</i>					Seymour.....	54	13	36.5	1.89
Athens (1).....	70	26	45.3	2.60	Shelbyville.....	47	14	33.4	0.70
Athens (2).....	70	23	45.1	3.56	Valparaiso.....	53	10	32.4	1.37
Blakely.....	80	27	53.4	1.91	Vevay.....	58	10	35.9	3.03
Diamond.....		23	40.6	2.88	Vincennes.....				2.06
Forsyth.....	75	32	51.6	2.58	Worthington.....	56	4	30.9	1.71
Fort McPherson.....	70	24	43.8	3.59	<i>Indian Territory.</i>				
Gillsville.....		26	47.1	4.05	Eufaula.....				1.80
Hephzibah.....	68	32	50.8	0.16	Fort Supply.....	73	6	42.4	0.09
Lithia Springs.....	72	31	48.1	1.26	Headton.....	70	25	48.0	2.96
Marietta.....	70	31	43.3	3.23	Tulsa.....				1.10
Milledgeville.....	69	29	47.8	2.25	<i>Iowa.</i>				
Monticello.....		31	44.6	2.66	Alta (1).....	62	—1	28.0	0.25
Point Peter.....		28	42.3	2.25	Amana.....	54	0	28.3	0.37
Poulan.....	78	22	50.1	1.05	Atlantic.....	68	—3	29.8	0.13
Quitman (1).....	75	39	53.4	2.15	Blanco.....	459	—109	23.79	1.00
Rome.....				11.33	Belle Plaine.....	58	2	27.2	0.42
Woolley's Ford.....	68	22	41.5	.....	Carroll.....	67	—2	30.1	0.16
<i>Idaho.</i>					Carson.....	56	4	31.6	1.19
American Falls.....	54	2	26.6	1.07	Cedar Falls.....	53	4	27.3	1.19
Boise Barracks.....	48	16	33.0	0.96	Cedar Rapids.....	55	0	29.1	0.40
Bonanza.....	46	—9	19.2	0.90	Clarinda.....	63	5	32.0	0.82
Era.....	50	2	23.6	0.82	Clinton.....	55	—1	26.1	0.30
Fort Sherman.....	58	25	37.9	1.91	Cresco.....	47	—10	22.3	0.44
Garden Valley.....	60	0	20.6	2.19	Eagle Grove.....	66	—14	26.7	0.50
Henry's Lake.....	44	—8	23.1	0.78	Fort Madison.....	55	13	31.2	2.25

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Iowa—Cont'd.					Kansas—Cont'd.				
Glenwood (1).....	72	4	34.3	0.00	Weskan.....	65	10	39.4	0.00
Greenfield.....	63	4	39.9	0.05	Winona.....	67			1.17
Grinnell.....	54	0	29.2	0.80	Yates Centre.....				
Humboldt.....	54	-15	26.1	1.00	Kentucky.				
Independence.....	51	-2	26.6	0.54	Bowling Green.....			4.45	
Indianola.....	64	-1	31.5d	0.36	Burnside.....			4.72	
Iowa City.....	58	6	33.1	0.57	Caddo.....			2.23	
Larabee.....				0.57	Cattlettsburgh.....	58	17	36.0	3.96
Le Claire.....				0.54	Canton.....	63	18	39.3	2.20
Logan.....	65	2	33.8	0.00	Central City.....	60	21	38.4	3.80
Manson.....	58	-8	25.9	0.52	Earlington.....	70	21	41.7	2.63
Maquoketa.....	53	5	27.7	0.24	Eddyville.....	59d	18d	39.4d	1.88
McCausland.....	51	9	26.5	0.71	Falmouth (1).....			3.80	
Monticello.....	51	0	26.0	0.13	Frankfort (1).....	64	14	35.4	4.27
Mount Pleasant.....	54	12	34.3	0.45	Frankfort (2).....	68	21	40.8	4.54
Mount Vernon.....	57	5	28.6	1.20	Franklin.....	59	14	36.3	3.94
Muscataine (2).....	59	5	29.1	0.34	Harrodsburgh.....	57	14	35.9	3.94
Osgoe.....	58	-7	22.5	0.75	Louisia.....	55	13	33.0	0.69
Oskaloosa (1).....	65	10	32.9	0.07	Mount Sterling.....	57	14	35.9	3.94
Panama.....	65	1	26.6	0.45	Newport Barracks.....	55	13	33.0	0.69
Sac City.....	55	-4	25.0	0.44	Pellville.....	58	18	37.2	3.28
Storm Lake.....	55	-4	27.5	0.44	Princeton.....	66	16	38.2	3.53
Vinton.....	54	-4	27.0	0.18	Richmond.....	59	12	36.8	3.59
Washington.....	54	-14	31.9	0.50	Shelbyville.....	58	12	35.0	3.74
Webster City.....	52	-18	25.0	1.40	Louisiana.				4.20
West Bend.....	51		23.4		Abbeville.....	79	31	56.4	2.40
Kansas.					Alexandria.....	80	24	52.8	3.77
Abilene.....	69	6		1.22	Amite City.....	80	25	55.3	2.52
Allison.....	65	4	27.5	0.05	Baton Rouge.....	82	25	56.0	1.37
Altam.....	73	7	35.6	1.08	Cameron.....	79	30	54.9	1.90
Altoona.....				0.50	Clinton d.....	81	27	55.4	1.67
Bucklin.....	66	8		0.00	Crowley.....	72	23	47.8	4.02
Buffalo Park.....	70	5		0.00	Davis.....	81	32	55.5	3.36
Burr Oak.....	70	10	34.2	0.00	Edgar.....	79	38	53.8	3.36
Calver City.....	60	9	35.2	0.00	Emilie.....	72	37	51.8	9.08
Columbia.....				1.55	Farmerville.....	74	26	49.8	3.87
Cunningham.....	70	7	34.9	1.79	Grand Cane.....	79	27	56.5	2.27
Downs.....				1.00	Grand Coteau.....	73	30	49.8	4.94
Elco.....	74	10	35.4	1.00	Homer.....	82	37	54.6	2.69
Elk Falls.....	70	8	42.5	0.44	Houma.....	76	31	53.8	1.65
Ellis (2).....	70	12		0.12	Jackson Barracks.....	81	27	56.2	2.05
Emporia.....	68	10	37.0	1.27	Jeanerette.....	80	32	53.0	1.70
Englewood.....	68	17	39.2	1.11	Lake Charles.....	78	21	50.0	1.91
Eureka Ranch.....	71	4	37.1	0.00	Liberty Hill.....	78	27	50.0	4.62
Ft. Leavenworth (1).....	70	9	37.4	0.49	Luling.....	77	27	53.6	1.75
Ft. Leavenworth (2).....	65	10	34.8	0.40	Marksville.....	76	28	54.2	1.70
Fort Riley.....	66	5	36.8	0.12	Melville.....	72	23	53.0	1.75
Fremont.....	73	4	37.5	1.00	Minden.....	75	24	54.0	4.46
Globe.....	65	8	32.0	1.00	Monroe.....	71	25	50.5	2.43
Gove City.....	79	7	34.8	0.00	New Iberia.....	82	24	51.2	2.07
Grainfield.....	65	8	39.2	0.00	Plaquemine.....	78	33	54.0	3.55
Grenola.....	68	10	39.7	0.90	Sugar Ex. Station.....	79	40	61.2	2.11
Grinnell.....	70	10	39.4	0.00	Thibodaux.....				2.23
Halstead.....	68	5	37.2	1.21	Winnabow.....				2.23
Havenville.....	63	2	30.8	0.70	Maine.				
Horton.....	67	8	36.5	0.15	Bar Harbor.....	49	-9	18.3	6.13
Hoxie.....	78	10	39.9	0.00	Belfast.....	35	-8	15.1	
Hutchinson.....				1.34	Calais.....	53	10	16.4	5.79
Independence.....	66	6	38.6	1.44	Cornish.....	45	-7	14.6	3.68
Kansas City.....	67	10	36.1	0.28	Fairfield.....	42	-26	7.4	3.39
Kelllogg.....	66	7	38.8	1.30	Farmington.....	41	-20	6.4	2.53
Kingman.....				1.25	Fort Preble.....	41	-5	19.4	2.25
Kirwin.....				0.00	Kennebec Arsenal.....	33	-20	7.0	0.38
La Crosse.....	69	9	37.4	1.20	Kent's Hill.....	35	-12	11.4	3.68
La Harpe.....	68	-3	32.9	0.05	Lewiston.....	37	-16	11.9	5.55
Lakin.....	67	15	36.0	1.00	Orono.....	47	-36	11.4	4.10
Lawrence.....	76	7	36.8	0.92	Petit Menan.....	45	-5	21.5	
Lebo.....	66	10			West Jonesport.....	40	-6	20.8	
Lincoln.....				0.25	Maryland.				
Macksville.....				0.57	Barren Creek Sp'gs.....	57	18	36.4	4.05
Manhattan (1).....	72	3	33.2	0.18	Cumberland (1).....	56	11	31.8	3.77
Manhattan (2).....	64	6	33.7	0.25	Cumberland (2).....	66	13	34.2	3.52
Manhattan (3).....	71	6	31.0	0.05	Fallston.....	53	14	31.5	3.80
Mankato.....	62	6	37.2	1.30	Fort McHenry.....	51	15	33.0	
Marmaton.....	70	5	30.9	0.10	Frederick.....	58	15	33.8	2.18
McAllister.....				1.22	Gaithersburgh.....				2.18
McPherson.....	64	4	33.3	0.25	McDonogh.....	65	18	32.2	2.55
Minneapolis.....	68	8	35.2	1.00	Mt. St. Mary's Col.....	55	11	31.3	3.60
Monument.....	60	12	35.2	1.00	Woodstock.....	53	12	32.2	2.30
Morse.....	68			0.00	Massachusetts.				
Oakley.....				0.00	Amherst.....	46	-5	23.9	3.15
Oberlin.....	70	10	33.1	2.00	Amherst Ex Sta (1).....	42	-6	21.7	3.18
Ogallah.....	65d	12d	41.7d	2.00	Amherst Ex Sta (2).....	44	-5	22.9	2.86
Oswego.....	62	6	31.9	0.00	Andover.....	47	2	23.2	2.69
Page City.....	69	13	37.4	1.00	Blue Hill (sum't).....	53	-1	23.4	5.26
Pauline.....	62	7	34.8	0.00	Blue Hill (base).....	55	0	24.5	4.93
Plainville.....	62	7		0.00	Blue Hill (valley).....	55	0	24.7	5.24
Quinter.....	62	7		0.00	Boston.....				3.82
Rome.....	67	11	38.9	0.80	Brewster.....	52	7	29.8	4.16
Salina.....	61	9	35.2	0.00	Cambridge (1).....	49	1	23.8	5.15
Scott City.....	74	6	41.6	0.00	Cambridge (2).....	52	2	23.8	4.70
Sedan.....	67	10	40.5	1.22	Chestnut Hill.....	54	1	25.4	4.40
Seneca.....	68	1	32.8	0.03	Clinton.....	50	-2	21.6	4.48
Sharon Springs.....	68	8	41.4	0.00	Concord.....	47	5	27.7	3.85
Shields.....	78	8	41.4	0.00	Cotuit.....	56	-9	21.1	
Sparrville.....	70	8	37.2	0.38	Deerfield.....				
Springvale.....	70	10		1.00					
Tribunet.....	66	6	35.4	0.05					
Wakefield.....	64	9	37.1	0.05					
Wa Keeney.....	70	14		0.00					
Wallace (1).....	70	12		0.00					
Wallace (2).....	70	12		0.00					
Wellington.....	70	10	39.0	0.79					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Massachusetts—Con.					Michigan—Cont'd.				
Dudley *.....	49	-2	22.4	3.34	Hayes.....	49	7	26.7	1.46
Fall River (1) *.....	54	6	28.0	4.67	Highland Station *.....	45	1	21.7	1.06
Fiskdale.....				2.40	Hillman.....	49	-17	23.9	0.68
Fitchburg (1).....	42	-4	20.8	3.71	Hilldale.....	45	4	26.2	0.81
Fitchburg (2).....	45	-6	20.3	2.99	Holt.....				0.61
Fort Warren.....	41	5	25.6	2.44	Howell.....	47	3	24.5	1.58
Framingham.....	50	-1	24.1	5.20	Ionia.....	48	5	27.7	1.58
Gilbertville.....	43	-6	22.3	3.75	Ivan.....	45	1	23.4	1.34
Groton (1).....	48	-2	22.0	3.28	Jackson.....	48	10	29.2	
Heath.....	38d	-8	16.4d		Jeddo.....	44	12	28.0	0.78
Kendall Green.....	50	0		5.55	Kalamazoo.....	50	13	29.1	1.35
Lake Cochituate.....	53	-2	23.8	5.25	Lansing.....	47	9	27.2	1.35
Lawrence.....	47	-3	21.1	4.96	Lathrop.....	42	-5	21.4	0.96
Leicester.....	49	-2	21.3	3.90	Madison.....	46	9	26.4	1.30
Leominster.....				3.48	Manton.....	44	0	23.6	1.39
Long Plain*.....	48	1	25.8	5.47	Marshall.....	46	6	23.7	1.50
Lowell (1).....	46	-4	21.7	4.46	May.....	46	8	26.2	1.28
Lowell (2).....	48	-2	21.3		Montague.....	45	2	26.8	0.66
Lowell (3).....	48	0	21.9		Mottville.....	49	5	26.7	1.12
Ludlow (1).....	45	-8	20.2	3.41	Noble.....				1.47
Ludlow (2).....	47	-6	23.8	2.52	North Aurelius.....				0.95
Lynn.....	46	1	22.3	5.39	North Marshall.....	45	5	23.8	1.52
Mansfield.....	45	0	24.6	5.02	Northport.....	46	11	27.2	2.24
Medford.....				4.14	Olivet.....	46	7	25.6	1.11
Middleborough.....	54	1	25.7	4.08	Otsego.....	48	9	27.2	3.04
Milton*.....	50	5	25.6	5.48	Ovid.....	44	7	25.0	1.16
Monson.....	48	-10	21.4	3.53	Parkville.....				3.12
Mount Nonotuck.....				2.37	Paw Paw.....	49	6	27.6	1.54
Mystic Lake.....				5.08	Pontiac.....	48	11	28.0	1.42
Mystic Station.....				4.27	Pulaski*.....	42	13	26.2	1.19
Nahant.....	49	7	29.7d		Rawsonville*.....	48	8	28.1	1.35
New Bedford (1).....	47	3	27.2	5.49	Romeo.....	46	6	25.2	
New Bedford (3).....	53	5	28.6	5.02	Roscommon.....	46	-12	21.4	2.00
Newburyport (1).....	50	1	23.4	5.51	Saint Ignace.....	42	3	23.3	1.25
Newburyport (2).....				2.91	Saint John's.....	48	9	26.0	1.03
Northampton.....	41	1	23.0	3.25	Sand Beach.....	47	6	24.1	2.69
North Billerica.....	49	0	24.0	2.85	Standish.....	40	-4	22.0	0.77
Plymouth.....	58	7	28.4	3.61	Stanton.....	48	5	24.2	0.63
Princeton.....	-6				Stockbridge.....				1.30
Provincetown.....	51	10	30.7	3.48	Thornville.....	48	8	26.8	1.43
Randolph.....				3.40	Vandalia.....	45	13	28.4	1.95
Roberts' Dam.....				4.17	Vienna.....				0.77
Royalston*.....	44	0	23.2	1.46	Washington.....	47	3	25.2	0.60
Salem (2).....				5.62	Weldon Creek.....	47	5	25.7	1.64
Somerset*.....	50	3	28.1	4.17	West Branch.....	47	-4	22.2	0.52
South Hingham.....				4.98	White Pigeon.....	46	2	26.0	
Springfield Army*.....	46	0	22.2	3.15	Williamston.....	54	12	33.4	1.66
Taunton (2).....	55	2	27.4	4.21	Ypsilanti (1).....	40	4	23.0	1.79
Taunton (3).....	56	1	27.1	4.28	Ypsilanti (2)*.....	45	8	25.4	0.94
Wakefield.....	53	0	25.1	5.62	Minnesota.				
Waltham.....				5.15	Alexandria.....				0.89
Wellesley.....	52	-1	29.7	3.74	Crookston.....	48	-22	18.1	0.05
Westborough*.....	52	-2	24.4	4.17	Faribault.....	55	-13	23.0	0.49
Winchester*.....				4.26	Farmington.....	46	0	24.0	0.50
Michigan.					Fergus Falls.....				0.40
Adrian.....	45	5	26.2	1.89	Fort Ripley†.....				0.30
Albion (1).....	46	11	28.2	1.31	Fort Snelling.....	54	-6	21.7	0.42
Allegan.....	51	5	27.8	1.97	Grand Meadow.....	47	1	20.5	0.19
Alma.....	49	1	25.4	0.93	L. Winnibigoshish.....	40	-17	16.9	0.30
Ann Arbor.....	45	9	25.3	0.98	Leech Lake.....	44	-21	16.5	0.17
Arbela†.....				1.25	LeSueur*.....	50d	-1d	24.5d	0.04
Atlantic*.....	44	4	22.2	2.10	Mankato.....	55	-8	26.7	0.49
Ball Mountain.....	44	4	23.8	0.77	Minneapolis*.....	51	-1	23.3	0.50
Bangor.....	49	3	28.9	2.47	Montevideo.....	53	-13	23.7	0.19
Bear Lake.....	43	-2	23.5	0.71	Morris.....	48	-13	21.4	0.18
Bellaire.....	47	-2	25.2	3.80	Northfield.....	53	-10	23.7	0.28
Bell Branch.....	40	8	25.9	0.70	Ortonville†.....				0.30
Benton Harbor.....	52	8	32.6	1.28	Pine River.....	42	-19	15.2	0.18
Berlin.....	47	7	29.3	1.15	Pokeyama Falls.....	44	-24	15.5	0.26
Berrien Springs (2).....				2.81	Pokedag Falls.....				0.23
Birch Run.....				0.84	Rolling Green.....	52	-10	22.6	0.53
Birmingham.....	49	5	25.5	1.10	Saint Charles *.....	50	1	25.6	0.39
Bronson.....	42	2	24.0	1.30	Sheldon*.....	46	-10	21.2	0.75
Calumet.....	43	1	21.6	0.83	Tracy†.....				0.10
Cassopolis.....	46	11	29.4	2.06	Mississippi.				
Caldwell.....	45	0	23.0	1.30	Agricultural Col'ge.....	72	26	48.8	2.47
Charlevoix.....	46	2	25.8	3.80	Batesville.....	73	21	46.6	3.15
Chesapeake.....	45	-3	22.0	1.30	Bay Saint Louis.....	70	38	53.7	6.30
Chelsea.....	48	4	24.9	1.15	Booneville.....	68g	25g	52.2g	2.89
Clinton.....	47	5	25.4	1.05	Brookhaven†.....	78	20	51.9	3.70
Colon.....	41	13	25.2	1.47	Canton†.....	73	24	50.2	2.27
Concord.....	44	8	25.3	1.24	Edward†.....	74	24	50.3	2.39
Crystal Falls.....	46	-1	19.5	0.77	Enterprise.....	73	25	49.8	3.04
East Saginaw.....	48	6	25.1		Payette.....	78	28	54.2	3.74
Eden.....	47	6	25.8	1.74	Greenville.....	69	27	49.0	3.90
Evart.....	45	-9	21.3	0.90	Hattiesburgh.....	78	31	50.1	2.10
Fairview.....	46	11	29.5	1.28	Holly Springs (1)*.....	66	23	46.9	3.86
Fitchburg.....	46	3	24.8	1.35	Kosciusko†.....	75	22	48.4	5.40
Flint.....	47	4	24.5	0.93	Logtown†.....	77	28	53.6	2.31
Fort Brady.....	42	5	21.0	2.48	Louisville†.....	76	19	49.0	3.39
Fort Mackinac.....	44	3	23.0	0.42	Moss Point†.....	76	30	54.8	1.75
Fort Wayne.....	49	5	26.2	1.62	Pearlington†.....	78	24	54.4	2.55
Fremont*.....	52	-2	26.0	0.76	Pontotoc†.....	70	22	46.4	5.14
Gaylord.....	44	-11	20.9	1.60	Rienzi.....	70	28	49.0	4.48
Gladwin.....	42	4	23.0	0.53	Ship Island.....	68i	39k	53.1i	6.91k
Grand Rapids.....	48	3	27.0	0.99	Summit.....	76e			1.48e
Grape.....	55	8	28.1	0.80	Vaiden.....	81	20	47.2	2.66
Grayling.....	45	-14	23.2	1.75	Washington†.....	74	26	52.8	5.67
Gulliver Lake.....	41	1	23.7	1.48	Water Valley*.....	74	23	48.2	3.46
Hanover.....	55	6	29.0	1.50	Waynesboro† (1).....	75	24	48.5	1.95
Harbor Springs.....	46	2	27.3	1.05	West Point.....	74	27	48.3	2.27
Harrison.....	41	-6	21.7	1.25	Yazoo City.....				3.63
Harrisville.....	46	-2	22.8	2.42	Missouri.				
Hart.....	50	10	32.8	1.05	Adrian†.....	64	3	32.8	0.77
Hastings.....	48	11	27.6	0.87	Appleton City.....	62	13	36.5	1.05

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip. in.	Stations.	Temperature. (Fahrenheit.)			Precip. in.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Missouri—Cont'd.</i>					<i>Nebraska—Cont'd.</i>				
Austin ¹	68	13	37.4	0.75	Plattsmouth.....	71	2	32.9	0.00
Boonville.....	64	12	33.6	0.31	Havanna.....	70	2	32.9	0.00
Brunswick.....	64	12	33.6	0.70	Seward.....	70	10	33.0	0.17
California.....	61	10	34.4	1.57	Superior.....	67	18	37.5	0.33
Carrollton.....	64	10	34.4	1.15	Syracuse.....	67	18	37.5	0.33
Carthage.....	64	10	34.4	1.98	Tecumseh.....	68	2	33.0	0.00
Cassville.....	64	10	34.4	1.07	Tekamah.....	68	2	33.0	0.00
Centerville.....	64	10	34.4	1.07	Wallace.....	70	2	33.0	0.00
Conception.....	64	10	34.4	1.07	Weeping Water.....	72	1	31.0	0.00
Dadeville.....	64	10	34.4	1.07	West Hill.....	65	1	30.0	0.10
Eldon.....	64	10	34.4	1.15	Whitman.....	64	8	30.7	0.10
Excelsior Springs.....	64	10	34.4	1.15	Wilcox.....	64	8	30.7	0.10
Payette.....	64	10	34.4	1.15					
Portsmouth.....	64	10	34.4	1.15					
Fort Scott.....	64	10	34.4	1.15					
Glasgow.....	64	10	34.4	1.15					
Gordonville.....	64	10	34.4	1.15					
Grand Pass.....	64	10	34.4	1.15					
Hannibal.....	64	10	34.4	1.15					
Harrisonville.....	64	10	34.4	1.15					
Hermann.....	64	10	34.4	1.15					
Jefferson Barracks.....	64	10	34.4	1.15					
Jefferson City.....	64	10	34.4	1.15					
Jerome.....	64	10	34.4	1.15					
Kansas City.....	64	10	34.4	1.15					
Lamotte.....	64	10	34.4	1.15					
Lebanon.....	64	10	34.4	1.15					
Liberty.....	64	10	34.4	1.15					
Louisiana Bridge.....	64	10	34.4	1.15					
Marshall (2).....	64	10	34.4	1.15					
New Haven.....	64	10	34.4	1.15					
Oak Ridge.....	64	10	34.4	1.15					
Oregon.....	64	10	34.4	1.15					
Pickering.....	64	10	34.4	1.15					
Platte River.....	64	10	34.4	1.15					
Princeton.....	64	10	34.4	1.15					
Saint Charles (1).....	64	10	34.4	1.15					
Saint Charles (2).....	64	10	34.4	1.15					
Saint Joseph.....	64	10	34.4	1.15					
Saint Louis.....	64	10	34.4	1.15					
Sarcoxie.....	64	10	34.4	1.15					
Sedalia.....	64	10	34.4	1.15					
Shelbina.....	64	10	34.4	1.15					
Steelville.....	64	10	34.4	1.15					
Stellana.....	64	10	34.4	1.15					
Warrensburg.....	64	10	34.4	1.15					
Warrenton.....	64	10	34.4	1.15					
Willow Springs.....	64	10	34.4	1.15					
Witcher's Mills.....	64	10	34.4	1.15					
<i>Montana.</i>									
Camp Poplar River.....	64	10	34.4	1.15					
Choteau.....	64	10	34.4	1.15					
Custer.....	64	10	34.4	1.15					
Fort Assiniboine.....	64	10	34.4	1.15					
Fort Custer.....	64	10	34.4	1.15					
Fort Keogh.....	64	10	34.4	1.15					
Fort Missoula.....	64	10	34.4	1.15					
Fort Shaw.....	64	10	34.4	1.15					
Glendive.....	64	10	34.4	1.15					
Martinsdale.....	64	10	34.4	1.15					
Powder River.....	64	10	34.4	1.15					
Virginia City.....	64	10	34.4	1.15					
<i>Nebraska.</i>									
Allamore.....	64	10	34.4	1.15					
Ansley.....	64	10	34.4	1.15					
Ashland.....	64	10	34.4	1.15					
Basett.....	64	10	34.4	1.15					
Beaver City.....	64	10	34.4	1.15					
Burwell.....	64	10	34.4	1.15					
Crawford.....	64	10	34.4	1.15					
Creighton.....	64	10	34.4	1.15					
Crete.....	64	10	34.4	1.15					
Culbertson (1).....	64	10	34.4	1.15					
David City.....	64	10	34.4	1.15					
De Soto.....	64	10	34.4	1.15					
Dunning.....	64	10	34.4	1.15					
Ericson.....	64	10	34.4	1.15					
Fairbury.....	64	10	34.4	1.15					
Fairfield.....	64	10	34.4	1.15					
Fort Niobrara.....	64	10	34.4	1.15					
Fort Omaha.....	64	10	34.4	1.15					
Fort Robinson.....	64	10	34.4	1.15					
Fort Sidney.....	64	10	34.4	1.15					
Franklin.....	64	10	34.4	1.15					
Fremont.....	64	10	34.4	1.15					
Geneva.....	64	10	34.4	1.15					
Genoa.....	64	10	34.4	1.15					
Gering.....	64	10	34.4	1.15					
Grand Island.....	64	10	34.4	1.15					
Grant.....	64	10	34.4	1.15					
Hastings.....	64	10	34.4	1.15					
Hay Springs.....	64	10	34.4	1.15					
Hebron.....	64	10	34.4	1.15					
Holdrege.....	64	10	34.4	1.15					
Howe.....	64	10	34.4	1.15					
Imperial.....	64	10	34.4	1.15					
Kimball.....	64	10	34.4	1.15					
Lexington.....	64	10	34.4	1.15					
Lincoln.....	64	10	34.4	1.15					
Lincoln (1).....	64	10	34.4	1.15					
Minden.....	64	10	34.4	1.15					
Nebraska City.....	64	10	34.4	1.15					
North Loup.....	64	10	34.4	1.15					
Oakdale.....	64	10	34.4	1.15					
O'Neill.....	64	10	34.4	1.15					
Palmer.....	64	10	34.4	1.15					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>New Jersey—Cont'd.</i>					<i>New York—Cont'd.</i>				
Woodbury.....	53	18	33.0	3.71	Watertown.....	38	-6	14.5	3.20
<i>New Mexico.</i>					Waterloet Arsenal.....	43	-5	14.5	3.20
Albert.....	67	17	44.8	0.74	Wedgwood.....	43	1	30.5	2.80
Antelope Springs.....	60	11	35.8	0.22	West Point.....	40	0	17.6	1.10
Bernalillo.....	62	12	38.0	2.00	White Plains.....	47	10	30.7	2.70
Chama.....	62	-2	30.9	0.30	Willets Point.....	49	10	30.5	3.40
Coolidge.....	53	13	30.6	1.80	<i>North Carolina.</i>				
Cuba.....	53	13	30.6	1.80	Asheville.....	69	16	39.3	2.40
Embudo.....	53	13	30.6	2.90	Bryson City.....	71	20	40.8	4.20
Estalina Springs.....	53	13	30.6	0.80	Chapel Hill.....	71	20	40.8	3.30
Fort Bayard.....	77	21	43.2	1.07	Curriack Inlet.....	67	18	37.6	2.80
Fort Marcy.....	55	10	31.8	1.54	Douglas.....	66	10	38.2	2.50
Fort Stanton.....	62	12	38.0	1.58	Franklin.....	62	11	35.2	2.50
Fort Union.....	62	5	32.6	0.14	Highlands.....	62	19	39.9	2.00
Fort Wingate.....	61	10	37.1	1.43	Hendersonville.....	62	18	38.9	2.50
Gallinas Spring.....	65	21	44.5	0.20	Lenoir.....	62	16	40.2	1.80
Hillsborough.....	63	23	43.2	0.69	Marion.....	67	16	41.5	2.10
Lordsburg.....	66	26	46.3	1.86	Morganton.....	69	17	41.2	1.80
Los Lunas.....	74	12	38.2	0.60	Mount Airy.....	62	14	37.0	4.10
Monero.....	52	-2	26.2	2.48	Mount Holly.....	68	18	35.4	4.50
Nogal.....	57	20	40.0	0.77	Mount Pleasant.....	68	18	35.4	4.50
Red Canon.....	57	20	40.0	0.88	Murphy.....	68	18	35.4	4.50
Springer.....	57	20	40.0	0.88	Oak Ridge.....	62	18	37.6	3.30
Taos.....	57	20	40.0	1.39	Pittsborough.....	66	19	40.3	3.40
<i>New York.</i>					Salisbury.....	59	27	43.2	3.70
Adams Centre.....	48	14	32.0	3.03	Smithfield.....	65	20	40.9	3.60
Adelphi Academy.....	44	-5	24.6	3.66	Soapstone Mount.....	73	20	45.0	6.70
Addison.....	44	-5	24.6	3.66	Washington.....	73	20	45.0	4.10
Afton.....	44	-5	24.6	3.66	Weldon.....	63	31	39.6	4.90
Akron.....	44	-5	24.6	3.66	Willeton.....	63	19	40.8	5.20
Alabama.....	40	-3	22.3	3.54	<i>North Dakota.</i>				
Alfred Centre.....	42	-4	21.1	2.72	Fort A. Lincoln.....	63	-8	25.8	0.20
Apulia.....	40	-3	22.3	3.54	Fort Buford.....	36	-1	26.4	0.00
Arcade (1).....	40	1	21.2	1.64	Fort Pembina.....	48	-20	16.8	0.10
Ardena.....	46	0	25.5	3.35	Fort Yates.....	62	-10	25.2	0.30
Au Sable Forks.....	40	-3	22.3	3.54	Gallatin.....	50	-22	16.0	0.00
Avon.....	40	-3	22.3	3.54	Grand Forks.....	48	-25	18.7	0.10
Baldwinsville.....	40	-3	22.3	3.54	Kelso.....	52	-18	19.1	0.00
Blood's Depot.....	40	-3	22.3	3.54	Napoleon.....	57	-7	21.9	0.30
Boyd's Corners.....	45	2	26.8	3.69	New England City.....	58	-6	21.3	0.50
Brookport.....	45	5	22.2	5.60	Steele.....	61	-10	22.0	0.30
Brookfield.....	36	-15	18.0	5.60	Wahpeton.....	54	-12	21.5	0.10
Canton.....	39	-10	12.5	1.94	Wild Rice.....	54	-16	15.1	0.20
Central Park, N. Y.....	47	13	29.9	3.70	<i>Ohio.</i>				
Chenango Forks.....	40	-3	22.3	3.54	Akron.....	47	13	29.4	2.48
Cherry Creek.....	40	-3	22.3	3.54	Ashland.....	49	9	29.6	1.82
Cooperstown.....	39	-6	18.4	4.34	Athens.....	54	8	32.8	3.30
David's Island.....	47	10	28.4	3.83	Bangorville.....	44	10	28.5	1.92
De Kalb Junction.....	47	10	28.4	3.83	Bellevue.....	48	6	27.2	1.20
Demeter.....	40	-3	22.3	3.54	Bement.....	46	9	26.9	1.72
Deposit.....	40	-3	22.3	3.54	Caledonia.....	47	6	29.3	1.91
Dunkirk (2).....	40	-3	22.3	3.54	Canton.....	47	6	29.3	1.91
Easton.....	40	-3	22.3	3.54	Colina.....	39	18	33.8	0.91
Fleming.....	41	3	21.9	1.80	Circleville (1).....	50	14	29.7	2.05
Fort Columbus.....	48	13	30.0	5.17	Clarksville.....	54	6	31.4	2.13
Fort Hamilton.....	50	15	32.4	5.25	Cleveland.....	50	14	30.7	1.93
Fort Niagara.....	46	10	27.2	0.56	Columbus Barracks.....	54	11	31.1	1.91
Fort Schuyler.....	49	6	28.1	4.62	Dayton.....	53	12	32.7	1.18
Fort Wadsworth.....	49	7	30.1	4.60	Demos.....	48	10	38.8	4.02
Galway.....	40	-3	22.3	3.54	Ellsworth.....	50	14	29.7	2.05
Geneva.....	50	0	24.4	3.53	Elyria.....	50	14	29.7	2.05
Hammondsport.....	42	-8	23.8	2.20	Findlay.....	50	14	29.7	2.05
Honeysuckle Brook.....	42	-7	22.8	3.38	Garrettsville.....	46	-4	26.8	3.31
Ithaca.....	46	3	26.0	3.47	Georgetown.....	56	9	34.4	2.86
Keene Valley.....	40	-17	7.5	2.59	Gratiot.....	51	6	31.1	2.76
Le Roy.....	44	-4	23.7	5.22	Greenville.....	49	13	30.5	1.91
Liberty.....	40	-3	22.3	3.54	Hanging Rock.....	57	12	33.8	4.38
Lowville.....	36	-10	12.4	3.80	Hassan.....	57	16	33.8	4.38
Lyndonville.....	40	-3	22.3	3.54	Hiram.....	45	13	26.7	2.35
Lyons.....	42	5	24.4	3.76	Hudson.....	55	10	32.2	1.95
Lyon Mountain (2).....	41	-18	15.4	2.52	Jacksonborough.....	52	11	28.2	1.14
Madison Barracks.....	39	-14	10.8	1.90	Kenton.....	52	11	28.2	1.14
Malone.....	39	-14	10.8	1.90	Leipsic.....	56	7	32.2	3.19
Mansfield.....	42	4	33.8	2.95	Logan.....	56	7	32.2	3.19
Middleton.....	42	4	33.8	2.95	Lordstown.....	44	2	29.2	3.29
Mount Morris.....	45	3	24.5	3.58	Mansfield.....	44	2	29.2	3.29
Newark Valley.....	39	-12	18.0	2.93	Marietta (1).....	55	16	34.6	5.68
New Lisbon.....	39	-12	18.0	2.93	Marietta (2).....	55	16	34.6	5.68
Ogdenburgh.....	34	-16	8.2	2.45	McConnelsville.....	52	8	31.5	3.71
Oxford.....	38	-7	17.7	3.61	Napoleon.....	51	13	31.7	1.11
Palermo.....	43	6	19.3	3.79	New Alexandria.....	47	10	30.0	5.85
Palmyra.....	41	4	24.0	2.79	New Comerstown.....	49	3	29.8	4.71
Pawling.....	48	8	24.7	4.17	North Lewisburgh.....	53	10	30.4	1.85
Peekskill.....	48	8	24.7	4.17	Oberlin.....	50	11	29.7	1.73
Pendleton Centre.....	40	-5	21.4	4.02	O. S. University.....	53	6	30.3	2.38
Perry City.....	40	-5	21.4	4.02	Orangeville.....	44	-2	26.0	2.75
Pine City.....	40	-5	21.4	4.02	Pomeroy.....	55	16	33.8	2.34
Plattsburgh.....	42	-9	14.0	1.93	Portsmouth (2).....	65	16	35.9	3.60
Plattsburgh B'ks.....	43	-13	11.3	2.45	Quaker City.....	50	8	30.6	0.80
Port Jervis.....	43	0	22.4	3.53	Shiloh.....	50	8	30.6	0.80
Potsdam.....	40	-10	11.0	2.00	Sidney.....	50	8	30.6	0.80
Poughkeepsie.....	45	-8	23.8	4.00	Springborough.....	50	15	30.4	1.03
Quaker Street.....	45	-8	23.8	4.00	Upper Sandusky.....	47	11	30.0	1.11
Rome.....	40	-7	17.7	4.03	Vienna.....	45	9	26.8	3.19
Romulus.....	42	4	21.1	2.06	Wauseon.....	50	6	37.7	1.15
Rondout.....	44	-3	24.3	4.00	Waverly.....	56	13	33.7	3.42
Sand Bank.....	54	11	31.0	5.65	Waynesville.....	48	12	33.0	1.98
Setauket.....	41	5	23.5	3.26	Westerville.....	52	6	31.3	1.92
Sherman.....	41	5	23.5	3.26	West Milton.....	53	12	33.1	2.07
Schodack Depot.....	43	-7	21.4	4.00	Westmouth.....	57	0	26.3	2.90
South Canioto.....	43	-7	21.4	4.00	Wheeler.....	48	15	28.8	1.74
S. E. Reservoir.....	41	-6	19.6	5.63	Wooster.....	48	15	28.8	1.74
Turin.....	37	-12	13.1	6.74	Youngstown.....	47	9	29.8	3.02
Utica.....	41	-6	19.6	5.63	Zanesville.....	47	9	29.8	3.02
Wappinger's Falls.....	41	-6	19.6	5.63					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Oklahoma Territory.	o	o	o	Ins.	Pennsylvania—Con.	o	o	o	Ins.
Fort Reno.....	76	6	42.4	0.14	Pottstown.....	53	12	29.7	2.56
Fort Sill.....	72	15	44.9	0.63	Quakertown.....	52	5	27.1	3.21
Guthrie.....	70	8	42.8	1.23	Rending.....	52	5	27.1	3.21
Oregon.					Ridgway.....	46	0	25.9	2.28
Albany.....	56	27	43.2	4.92	Rimersburg.....	40	12	25.8	5.45
Ashland (1).....	53	21	37.5	2.85	Saltzburgh.....	47	3	25.6	3.31
Ashland (2).....	58	30	39.6	1.98	Seisholtzville.....	47	6	28.2	4.38
Bandon.....	60	28	50.6	7.62	Smith's Corners.....	44	7	24.5	2.66
Beulah.....	51	6	28.4	0.92	Somers.....	50	1	26.8	2.52
Burns.....	51	0	25.8	0.50	South Eaton.....	47	3	25.6	3.31
Cascade Locks.....	55	41	48.0	3.80	State College.....	48	1	25.4	3.19
Corvallis.....	57	25	42.4	3.50	Stoyestown.....	51	15	30.7	2.49
Deer Island.....	56	27	41.2	1.33	Troy.....	50	13	25.2	5.00
East Portland.....	53	29	41.2	4.33	Uniontown.....	53	9	33.1	6.84
Eola.....	53	29	41.2	4.33	Warren.....	45	10	22.2	4.97
Eugene.....	60	28	44.2	2.76	West Chester.....	51	14	30.0	3.94
Forest Grove.....	57	28	40.6	4.81	Westtown.....	50	13	30.8	3.30
Gardiner.....	61	34	47.2	6.64	Wilkes Barre.....	48	9	23.5	3.95
Gold Beach.....	64	35	49.0	4.67	Wysox.....	43	9	23.7	3.48
Grant's Pass.....	67	24	39.1	2.96	York.....	56	6	29.8	3.29
Hardman.....	52	22	38.7	0.87	Rhode Island.				
Heppner.....	66	24	42.0	1.42	Bristol.....	50	5	28.2	4.95
Hood River.....	60	27	40.6	3.09	Fort Adams.....	55	4	26.8	3.61
Hubbard.....	58	24	41.3	4.35	Kingston (1).....	54	1	27.4	5.51
Huntington.....	57	16	35.5	1.00	Kingston (2).....	52	3	26.8	6.16
Jacksonville.....	53	21	39.4	2.52	Lonsdale.....	51	1	25.4	3.19
Joseph.....	52	16	29.8	1.17	Olneyville.....	54	6	30.0	5.06
La Grande.....	55	18	39.8	0.90	Pawtucket.....	52	6	28.0	5.28
Lakeview.....	57	16	35.5	1.00	Providence (1).....	51	2	26.3	4.33
Lone Rock.....	56	22	39.4	1.14	Providence (2).....	51	2	26.3	4.33
McMinnville.....	56	22	39.4	1.14	South Carolina.				
Mount Angel.....	57	27	42.0	3.72	Aiken.....	70	27	48.4	1.01
Pendleton.....	63	21	40.5	1.46	Belmont.....	67	22	44.6	2.09
Silver Lake.....	65	6	32.6	T.	Brewer Mine.....	68	27	44.5	3.93
Siskiyou.....	55	30	39.9	1.38	Cheraw.....	68	19	43.7	1.96
Telocast.....	61	25	37.2	1.19	Conway.....	76	24	44.6	1.07
The Dalles.....	61	25	37.2	1.19	Evergreen.....	68	20	44.6	1.07
Tillamook R'k L.H.....	64	32	47.4	2.05	Greenville.....	75	23	48.2	1.09
Tolodo.....	64	32	47.4	2.05	Jacksonborough.....	59	25	40.4	2.02
Vernonia.....	54	32	42.1	8.59	McCormick.....	73	34	51.6	2.05
Pennsylvania.					Simpsonville.....	68	22	44.0	3.11
Allegheny Arsenal.....	10	10	4.98	3.80	Spartanburgh (1).....	76	14	42.6	3.39
Altona.....	56	14	34.5	2.25	Spartanburgh (2).....	68	24	45.6	1.20
Aqueduct.....	55	10	29.9	2.25	Statesburg.....	69	26	46.8	1.81
Blooming Grove.....	45	0	24.1	4.10	Trial.....	72	28	48.1	1.31
Blue Knob.....	44	6	23.4	8.63	Walhalla.....	66	20	43.2	2.85
Brookville.....	44	6	23.4	8.63	Yorkville.....	68	24	44.0	3.35
Browers Look.....	44	6	23.4	8.63	South Dakota.				
Carlisle.....	56	8	28.6	4.20	Aberdeen.....	51	5	22.8	0.20
Catawissa.....	45	10	28.5	4.10	Alexandria.....	62	14	25.4	0.20
Chambersburg.....	58	5	27.6	3.83	Brookings.....	56	20	21.4	0.80
Charlesville.....	59	5	27.4	3.83	Canton.....	58	12	28.1	0.60
Clarion (1).....	59	5	27.4	3.83	Clark.....	54	20	22.7	0.20
Coatesville.....	53	7	28.3	3.51	De Smet.....	54	13	21.1	0.60
Confluence.....	53	7	28.3	3.51	Flandreau.....	51	19	27.2	0.39
Coopersburg.....	53	11	28.2	3.76	Fort Bennett.....	61	9	27.2	0.24
Corry.....	44	4	25.1	3.36	Fort Meade.....	73	5	31.9	0.36
Davis Island Dam.....	44	4	25.1	3.36	Fort Randall.....	70	6	30.7	0.05
Doylstown.....	44	4	25.1	3.36	Fort Sully.....	64	2	29.2	0.32
Du Bois.....	44	4	25.1	3.36	Highmore.....	57	9	26.2	0.20
Dyberry.....	43	11	20.6	5.29	Howard.....	54	30	30.8	0.75
Eagle's Mere.....	38	4	22.1	7.02	Kimball.....	60	3	22.4	0.40
Easton.....	40	10	25.1	3.36	Millbank.....	60	7	28.9	0.45
Edinborough.....	37	9	24.8	3.36	Olneyville.....	60	0	28.6	0.10
Emporium.....	48	7	27.4	3.21	Parkston.....	70	4	30.3	0.15
F'ks of Nesaminy.....	30	30.4	2.51	1.70	Saint Lawrence.....	58	0	26.6	0.35
Frankford Arsenal.....	52	11	31.6	2.44	Seranton.....	55	7	25.1	0.87
Frederick.....	52	11	31.6	2.44	Sioux Falls.....	52	17	24.5	0.75
Freeport.....	52	11	31.6	2.44	Spearfish.....	71	4	34.7	0.53
Germantown (1).....	46	18	30.3	2.41	Vermillion.....	57	8	26.5	0.10
Germantown (2).....	46	18	30.3	2.41	Webster.....	56	19	25.8	2.28
Girardville.....	46	10	27.5	4.65	Wolsey.....	55	11	24.0	0.65
Grampian Hills.....	44	0	24.0	4.15	Woonsocket.....	57	21	22.9	0.70
Greensborough.....	50	1	26.6	2.93	Tennessee.				
Greenville.....	50	1	26.6	2.93	Andersonville.....	56	18	37.1	4.75
Hamburg.....	57	2	28.4	5.71	Ashwood.....	55	23	43.3	3.72
Holidaysburgh.....	57	2	28.4	5.71	Austin.....	62	20	41.8	3.03
Honesdale.....	45	9	22.1	4.01	Carthage.....	62	20	40.8	3.46
Huntingdon.....	52	5	25.9	3.35	Charleston.....	62	20	40.8	3.46
Indiana.....	47	7	27.4	6.51	Clarksville.....	62	20	40.8	3.46
Johnstown.....	51	7	29.9	4.89	Columbia.....	62	20	40.8	3.46
Kennett Square.....	51	7	29.9	4.89	Covington (1).....	68	21	44.0	4.15
Kilmer.....	53	10	31.0	3.06	Cumberland Gap.....	55	21	37.8	6.04
Lancaster.....	56	9	31.4	1.08	Fayetteville.....	66	24	43.2	2.11
Lansdale.....	56	9	31.4	1.08	Florence Station.....	65	23	41.8	4.09
Le Roy.....	40	0	22.4	5.78	Franklin.....	66	20	41.7	4.32
Lewisburgh.....	48	6	27.8	3.99	Greenville.....	59	21	37.8	3.71
Ligonier.....	52	4	29.9	3.69	Hohenwald.....	59	16	42.7	4.59
Lock Haven.....	50	0	26.6	4.43	Jacksborough.....	59	18	39.0	4.53
Lock No. 4.....	50	0	26.6	4.43	Johnsonville.....	59	18	39.0	4.53
Mahoning.....	50	0	26.6	4.43	Kingston (1).....	59	18	39.0	4.53
Mauch Chunk.....	45	4	27.1	3.18	Lewisburgh.....	68	20	42.0	3.99
McConnellsburgh.....	58	6	29.4	3.30	Lookout Mountain.....	60	21	41.7	4.10
Meadville (2).....	43	8	25.5	3.10	Loudon.....	76	24	44.4	4.56
Myerstown.....	52	1	26.2	3.98	Lynnville.....	60	20	41.8	4.10
New Castle.....	45	3	29.8	2.13	Missionary Ridge.....	68	16	42.4	3.11
Nisbet.....	45	3	29.8	2.13	Nunnally.....	68	16	42.4	3.11
Oil City.....	45	3	29.8	2.13					
Ottaville.....	45	3	29.8	2.13					
Parker's Landing.....	58	4	29.0	3.21					
Petersburgh.....	58	4	29.0	3.21					
Philadelphia.....	50	8	24.6	4.17					
Phillipsburgh.....	54	10	30.8	2.69					
Phoenixville.....	54	10	30.8	2.69					
Point Pleasant.....	54	10	30.8	2.69					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
Tennessee—Cont'd.					Vermont—Cont'd.				
Parksville †	65	22	42.7	3.11	Weatherfield C'tro	40	10	14.0	
Riddleton	69	18	40.2	5.46	Virginia.				
Rockwood †				4.47	Abingdon				5.46
Rogersville	53	19	36.7	5.38	Birdsneat	63	23	41.0	6.30
Rugby †	60	14	38.4	4.03	Bolar *	56	5	27.6	4.79
Savannah	72	20	42.5	5.31	Casanova	58	14	36.4	2.74
Sharps	68	18	44.8	3.68	Christiansburgh †	57	13	34.7	1.77
Springdale	60	17	39.5	5.72	Dale Enterprise †	60	3	31.6	3.46
Strawberry Plains †				4.35	Fall Creek Depot	60	23	39.2	5.70
Trenton	66	30	40.8	5.09	Fort Monroe	60	26	40.6	4.39
Union City	68	22	41.3	4.45	Fort Myer	58	14	32.2	3.87
Waynesborough	65	20	42.2	2.50	Lexington †	62	8	33.0	3.60
Texas.					Marion	56	16	33.8	3.20
Austin (1)	83	27	54.7	0.85	Mossing Ford *	55	20	34.4	4.82
Austin (2)	84	29	54.8		Petersburgh †	63	20	38.0	3.70
Austin (3) *	85	28	54.1	1.57	Richmond †	75	17	44.2	3.91
Brady	79	22	48.7	1.70	Salem	65	20	38.9	3.68
Berlin	79	22	51.8	3.32	Stannardsville	60	24	40.8	3.26
Brasoria †	80	25	55.5	1.38	Stanton	62	8	34.0	3.23
Brenham †	72	28	56.8	1.84	Summit	63	8	31.6	
Brownwood †	78	22	51.0	2.70	Woodstock †				4.45
Burnet	74	30	53.2	1.32	Wytheville	54	18	34.5	2.74
Camp del Rio	90	22	54.0	0.73	Yancey's Mills	61	12	35.1	2.73
Camp Eagle Pass	85	23	50.7	0.45	Washington.				
C'p Peña Colorado	75	11	45.2	0.70	Blakeley †	58	30	45.4	7.73
Childress	72	21	45.5	0.70	Chehalis	54	29	43.6	5.31
Coldwater	69	106	39.08	1.16	Doe Bay †	58	39	45.0	4.48
College Station	80	24	57.6	1.73	East Sound †	58	32	44.9	6.62
Columbia	82	29	57.4	0.55	Fairhaven	62	31	46.2	
Corianna (2)	74	22	52.8	0.89	Fort Canby	58	36	47.4	8.91
Durham †				0.00	Fort Simcoe †	56	30	39.0	1.10
Duval	82	28	53.8	0.60	Fort Spokane	52	20	33.2	0.45
Epworth	67	27	45.8	0.00	Fort Townsend	56	30	44.8	3.30
Forestburgh *	80	35	53.4	2.15	Fort Walla Walla	66	24	42.3	0.63
Fort Bliss	70	25	48.3	0.25	Lapush	52	14	35.0	11.24
Fort Brown		35		0.30	Seattle	55	32	45.5	5.89
Fort Clark	78	27	54.4	2.00	Tacoma	59	33	45.5	5.72
Fort Davis	70	24	48.0	1.22	Vancouver B'ks	58	30	41.8	3.84
Fort Hancock	75	12	44.6	0.10	West Virginia.				
Fort McIntosh	86	30	58.5	0.20	Buckhannon †				5.49
Fort Ringgold	92	26	60.8	0.19	Charleston †				4.45
Fredericksburgh	84	26	51.0	1.82	Ella *	48	14	31.5	4.50
Gallinas †	82	20	54.0	0.98	Glenville				6.04
Graham	74	15	46.1	1.26	Harper's Ferry †				3.16
Grapevine *	77	21	52.6	2.50	Hinton				3.29
Hansford	70	166	37.2	0.05	Kingwood	50	10	26.4	
Houston †	80	24	55.6	1.55	Mont Alto *		10	25.4	4.80
La Grange *		26	53.9	1.73	Morgantown				3.87
Lampasas	82	23	51.0	0.83	Pleasant Hill *	52	14	30.6	
Longview †	77	25	52.8	4.35	Point Pleasant †				4.26
Mesquite	77	30	51.4	0.89	Rousesburgh †				3.28
Mountain Springs	76	21	50.2	2.14	Tannery *	52	12	31.3	3.18
New Braunfels	84	24	54.4	1.34	Tyler's Creek	39	15	32.3	
New Ulm	86	26	56.1	1.27	Weston				3.11
Panhandle	66	12	41.4	0.20	Wheeling †				5.98
Panther		22	53.0	1.71	White Sulph' B'gs.				1.71
Round Rock	80	24	54.2	1.70	Wisconsin.				
San Antonio	86	28	56.7	1.58	Bayfield	53	3		0.50
Sierra Blanca	80	45	69.8	0.00	Butternut †		18.1	0.39	
Silver Falls	76	21	48.3	T.	Cadis		4	24.8	0.80
Sugar Land	79	29	57.0	2.00	Chippewa Falls				0.44
Waco (2) †	82	31	52.8	0.30	Columbus				0.33
Weatherford †	75	20	54.6	2.68	Delevan				2.16
Wichita Falls *	71	24	47.6	3.00	De Pere	48	3	25.9	0.98
Utah.					Embarass *	48	8	22.2	1.05
Alta	40	0	25.6	2.40	Fond du Lac	46	5	24.0	0.75
Benver †		5	20.4	0.50	Glasgow	42	7	29.1	0.13
Bingham		17	28.6	0.46	Greenwood	50	15	20.8	1.32
Blue Creek *	47	17	31.1	0.55	Hayward	68	10	23.0	0.28
Corinne	51	15	30.6	0.90	Honey Creek *	50	0	26.8	0.68
Fort Douglas	57	20	36.4	0.16	Ithaca		3	23.5	0.41
Fort Duchesne	48	6	26.8	0.27	Koopenciek				0.55
Grouse Creek				0.48	Lincoln *		13	27.2	0.22
Kelton *	52	8	33.0	0.35	Madison	46	5	26.3	0.62
Logan *		24	35.8		Manitowoc	49	2	39.4	0.65
Loosee	54	11	30.5	0.80	Medford (1) †				0.80
Moab †	59	13	35.4	0.55	Medford (2)	48	10	22.8	0.24
Mount Carmel †		17	29.4	2.71	Neillville *	47	10	22.6	0.25
Mount Pleasant	42	12	25.6	1.57	Oconto	55	3	27.3	0.86
Nephi †	57	7	31.4	1.38	Oshkosh †	58	3	24.6	0.50
Ogden (1)	50	30	33.6	2.22	Peshigo	47	4	23.0	0.15
Ogden (2) †		24	36.0	1.86	Phillips †				0.33
Park City		10	27.4	1.42	Portage †	53	4	27.4	1.34
Parowan *	63	11	33.2	0.34	Wauzeka *		10	22.4	0.40
Price †				0.60	Weston		26	31.46	1.50
Promontory	61	13	33.9	0.40	Wyoming.				
Provo City		30	39.3		Camp Pilot Butte	52	13	16.9	0.91
Richfield †	57	107	38.0	0.38	Camp Sheridan	47	2	27.7	0.89
Saint George	66	17	43.1	0.55	Fort D. A. Russell	70	3	33.3	0.00
Snowville	57	29	40.5	0.19	Fort Fetterman	59	3	29.2	0.00
Sockton		10	29.0		Fort McKinney	70	9	36.2	T.
Terrace *	50	10	29.7	0.37	Fort Washakie	57	2	28.7	T.
Uintah		20	39.6		Laramie	53	0	29.6	0.10
Vermont.					Lusk	60	10	32.2	T.
Brattleborough (1).	44	10	18.9	4.16	Saratoga	47	14	24.0	
Brattleborough (2).	43	4	19.7		Wheatland	36	0	17.4	0.00
Burlington	47	10		1.90	British Columbia.				
Chelsen *	40	12	13.0	3.32	New Westminster	56	31	43.4	9.76
Conwall				2.74	Canada.				
East Berkshire †	38	34	11.2	3.37	McGill Col. Obs'g.	35	13	7.1	2.79
Hartland	42	18	14.2	3.50	Mexico.				
Jacksonville	40	16	15.3	5.05	La Logia *	86	48	69.2	0.91
Lanenburgh *	34	16	10.8	3.10	Leon de Aldemas	72	34	55.6	0.44
Strafford *	40	14	13.4	3.30	Mazatlan	81	66	75.1	0.44
Vernon	40	10	19.1	2.18					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Mexico—Cont'd.	6	0	0	Ins.	Newfoundland.	0	0	0	Ins.
Mexico	68	36	52.0	0.26	Saint John's	49	9	27.5	5.81
Puebla	76	34	55.8	T.	Dutch Guiana.				
Topolobampo	79	67	71.8	0.61	Burnside-Coronee ..	94	69	78.4	7.94
Zacatecas	73	28	49.6	1.44	West Indies.				
New Brunswick.					Hamilton, Ber	77	53	65.1	4.13
Saint John	47	-11	16.4	6.38	Havana	86	56	73.9	0.90

Received too late for general discussion of weather for December, 1890.

Alabama.					Colorado—Cont'd.				
Seima (3)				3.04	Morgan	65	6	24.7	0.03
Arizona.					Pagoda (near)	56	-1	26.0	1.90
Signal	71	35	53.9	1.08	Pagosa Springs	48	-15	24.3	0.39
California.					Parachute				0.49
Crescent City L. H.				8.66	Red Cliff				0.80
East Brother L. H.				1.55	Rico				0.04
Farrallon L. H.				1.26	River Bend	66	14	35.7	0.10
Humboldt L. H.				5.62	Saint Cloud				0.00
Pt. Año Nuevo L. H.				2.77	Sanborn				0.00
Point Arena L. H.				4.05	Sedgwick				0.05
Point Boneta L. H.				3.59	Sheridan Lake				0.04
Pt. Conception L. H.				2.20	Stamford				1.85
Point Montara L. H.				2.46	T. S. Ranch	53	14	32.5	T.
Point Reyes L. H.				1.37	Thon	71	9	34.4	T.
Presidio of San F.				4.75	Upper Pine				0.60
Yerba Buena L. H.				0.70	Villas				0.19
Colorado.					Villa Grove				0.40
Abbot				0.00	Waterville				0.00
Agates	63	29	41.0	0.13	Watkins	49	17	26.6	0.05
Alford				T.	Westcliffe	57	-7	26.3	0.05
Alma	46	-2	24.2	T.	Wray				T.
Arroyo				0.15	Massachusetts.				
Bennet	57	24	44.4	0.05	Worcester (1)	46	-2	21.1	4.45
Box Elder				0.05	Michigan.				
Breckenridge	72	-21	26.9	0.01	Berrien Springs (1) ..	50	9	31.1	2.65
Brish				0.01	Montana.				
Burlington	68	-7	24.6	0.03	Blackfoot Agency ..	54	-3	31.8	0.40
Byers	62	10	33.0	0.03	Horr	49	-5	23.0	1.80
Canon City	66	11	42.6	0.03	Nebraska.				
Climax	42	-4	22.0	0.85	Kennedy	68	8	32.6	0.53
Como (near)	43	0	22.0	0.02	New York.				
Cumbres	47	-12	21.2	5.40	Amersand	35	-19	10.3	3.03
Deer Trail	66	10	35.0	0.76	Binghamton				3.15
Delta	50	14	32.2	1.38	Constableville				2.72
Dillon				T.	Dunkirk (1)	46	10	28.6	0.00
Eagle Farm				0.15	Elmira				2.54
Elkhorn				0.26	Factoryville	46	-15	23.3	4.34
Emma	66	20	31.0	0.10	Hess Road Station ..	41	2	24.7	1.60
First View	63	9	40.0	0.04	Humphrey	48	5	23.9	1.91
Greenhorn	60	11	33.7	0.22	Marshland	46	-7	23.4	2.70
Hugo	58	7	33.7	0.22	Middleburgh	40	-4	19.7	3.15
Idaho Springs	72	4	34.8	0.00	North Hammond	44	-9	14.3	1.75
Julesburg				0.00	Number Four	34	-15	11.1	3.32
Kirk	70	24	50.0	0.25	South Kortright ..	43	-13	19.0	5.25
Kit Carson	78	8	37.6	0.36	Texas.				
Las Animas				0.36	Menardville	78	22	49.2	2.36
Lay	53	3	24.1	0.38	Santa Maria				0.17
Leadville	63	13	31.4	0.01	Venus	76	18	49.8	0.69
Le Roy				0.15	Wisconsin.				
Livermore	69	12	37.0	0.15	Beloit	52	-2	26.3	0.55
Longmont				0.15	West Indies.				
Minneapolis	46	-6	23.3	0.11	Grand Turk Island ..	85	80	83.9	1.59
Monte Vista	55	1	33.0	0.35					
Moraine									

Received too late for publication in November, 1890.

Arizona.					Mississippi.				
San Simon	91	35	58.0	0.50	Palo Alto	86	31	59.6	0.03
Wood Cañon				4.00	Summit				0.57
Arkansas.					Missouri.				
Mount Nebo	75	32	54.3	3.27	Columbia	78	23	47.0	0.80
California.					Saint Louis	77	23	46.2	1.87
Bishop Creek	82	33	55.0	0.00	Montana.				
Boca	70	8	43.8	0.00	Martinsdale	66	5	38.0	0.80
Felton	90	26	54.7	0.12	Nevada.				
Indio	98	40	68.5	0.00	Reno State Univ'ty ..	68	18	36.5	0.00
Jolon				0.57	New Mexico.				
Merced	111?	33	59.7	0.00	Bernalillo				0.60
Monterey (Hotel ..				0.00	Monero	64	-3	31.9	1.76
del Monte)	79	37	55.4	0.00	South Carolina.				
Mount Hamilton ..	77	32	55.5	0.58	Aiken	78	33	59.5	0.50
Mullana	77	32	51.0	0.00	South Dakota.				
Santa Rosa	75	33	53.7	0.00	Brookings	68	0	29.4	0.30
Suisun City	89	38	55.9	0.00	Texas.				
Truckee (1)	68	16	37.0	0.00	Edinburgh				0.15
Walnut Creek	77	35	55.7	T.	Virginia.				
Georgia.					Bedford City	62	32	49.1	0.55
Lithia Springs	78	37	59.4	0.02	Wisconsin.				
Idaho.					Beloit	56	20	38.6	2.16
Lewiston	62	21	37.7	0.05	Wyoming.				
Kootenai	61	19	34.1	0.50	Saratoga	60	0	26.5	1.00
Indiana.					Dutch Guiana.				
Evansville				3.08	Burnside-Coronee ..	92	70	79.4	1.34
Iowa.					West Indies.				
Muscatine (2)	66	22	40.8	1.38	Havana	86	68	79.0	1.18

Letters of the alphabet denote the number of days missing from the record, thus: the letter c indicates three days missing, etc., etc.

*Extremes of temperature from observed readings. †Signal Service instruments.

‡One observation daily at 10 a. m. †For 15 days.

Mean temperature (degrees Fahr.) observed at Charleston, S. C., by Drs. Lining, Chalmers, Dawson, and Johnson, John Ryan, U. S. Army surgeons (Fort Moultrie), and Signal Service observers.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
1738 ...	56.5	54.0	69.0	70.0	74.5	82.0	81.0	78.5	73.5	62.0	54.0	51.5	66.4
1739 ...	49.0	52.0	62.0	67.0	75.0	77.5	78.5	78.5	69.5	64.0	54.0	56.0	65.2
1740 ...	46.0	54.5	58.5	69.5	74.0	78.5	81.0	77.5	75.0	59.5	53.0	44.5	64.3
1742 ...	52.0	48.5	56.5	72.0	74.5	77.5	82.5	81.0	72.5	62.0	49.5	52.5	65.1
1750 ...	[49.9]	57.0	63.0	65.0	73.0	83.0	75.0	80.0	77.0	67.0	55.0	53.0	[66.5]
1751 ...	47.0	54.0	62.0	72.0	76.0	83.0	80.0	78.0	70.5	64.0	60.0	54.0	66.7
1752 ...	44.0	58.0	64.0	67.0	74.0	79.0	85.0	78.0	72.0	69.0	65.0	53.0	67.3
1753 ...	53.0	58.0	60.0	65.0	74.0	79.0	78.0	80.0	75.0	69.0	55.0	55.0	66.8
1754 ...	56.0	57.0	65.0	64.0	77.0	81.0	75.0	81.0	76.0	70.0	56.0	56.0	67.8
1755 ...	51.0	48.0	56.0	63.0	71.0	78.0	79.0	77.0	74.0	63.0	54.0	49.0	63.6
1756 ...	55.0	60.0	62.0	63.0	73.0	76.0	84.0	78.0	76.0	66.0	59.0	52.0	67.0
1757 ...	47.0	52.0	61.0	65.0	72.0	77.0	78.0	79.0	75.0	67.0	61.0	55.0	65.7
1758 ...	54.0	51.0	61.0	62.0	70.0	79.0	81.0	80.0	73.0	67.0	61.0	42.0	64.3
1759 ...	44.0	49.0	53.0	61.0	71.0	83.0	86.0	83.0	75.0	65.0	60.0	49.0	65.1
1823 ...	48.5	43.1	57.1	65.4	75.1	76.0	81.2	79.8	76.4	66.3	56.8	50.9	64.7
1824 ...	52.9	49.4	60.9	64.6	74.7	79.7	82.8	80.1	75.9	68.4	58.3	54.7	64.9
1825 ...	50.3	52.8	61.4	62.6	72.9	79.3	82.1	81.6	77.4	70.9	[58.1]	[51.9]	[67.0]
1826 ...	.....	.....	.....	69.3	73.8	81.1	81.6	81.0	72.2	62.8	54.1	[51.9]	.....
1827 ...	44.9	50.9	62.4	69.1	73.7	77.2	83.3	80.7	76.7	[66.7]	[58.1]	[51.9]	[67.0]
1828 ...	61.5	64.7	64.0	65.1	77.3	86.2	82.7	82.7	78.2	68.6	62.9	59.7	71.1
1829 ...	51.4	46.4	53.6	63.7	66.2	82.8	84.1	84.3	77.8	[66.7]	[58.1]	[51.9]	[65.6]
1830 ...	55.8	54.5	63.2	67.3	74.9	79.4	83.2	82.5	81.5	74.2	68.8	56.5	70.2
1831 ...	45.6	48.4	59.8	68.6	71.8	79.6	80.4	81.4	78.2	71.7	63.3	41.6	65.9
1832 ...	48.7	57.3	58.9	64.1	72.9	76.9	79.9	80.0	76.0	67.6	59.2	54.4	66.3
1833 ...	53.2	55.3	57.1	64.3	74.1	77.8	81.3	79.4	77.4	68.1	56.2	50.3	66.1
1834 ...	49.2	57.9	58.2	63.8	71.3	80.7	82.4	79.7	76.5	68.6	59.4	53.1	66.7
1835 ...	46.8	40.1	51.7	61.9	73.7	79.7	79.9	80.0	72.9	67.5	64.5	51.5	64.2
1840 ...	47.7	59.0	60.7	68.7	78.0	78.7	78.7	80.7	78.7	70.3	56.3	53.3	67.0
1841 ...	54.0	48.7	58.0	64.7	71.7	79.7	82.3	80.7	78.3	62.3	60.7	53.3	66.2
1842 ...	53.2	53.4	63.3	66.8	71.8	77.0	78.0	71.1	76.2	66.3	53.5	49.3	65.0
1843 ...	53.7	48.7	58.8	64.7	71.6	78.1	81.5	80.5	76.8	67.3	59.6	52.4	65.7
1844 ...	47.1	49.7	56.3	65.2	75.9	78.1	81.1	79.0	74.8	65.8	61.7	52.1	65.6
1845 ...	54.8	53.1	59.2	68.9	72.4	80.7	82.8	80.5	73.2	67.3	57.6	44.6	60.2
1846 ...	50.6	51.6	58.6	65.9	74.4	79.3	80.6	82.8	78.9	[66.7]	61.5	53.4	[67.9]
1847 ...	51.4	54.0	54.0	65.4	67.6	78.1	77.6	80.2	74.8	68.1	61.7	50.0	65.2
1848 ...	50.0	50.2	59.5	66.1	[73.0]	79.5	81.7	82.7	77.1	64.3	50.2	61.7	[66.3]
1849 ...	49.5	49.0	56.7	64.7	72.6	81.2	78.9	81.2	75.3	67.9	60.9	54.2	66.2
1850 ...	54.9	50.7	56.2	62.5	71.8	76.8	83.8	83.3	77.8	66.3	56.8	55.6	66.4
1851 ...	50.8	57.3	60.0	65.5	73.3	78.6	81.9	81.2	73.6	67.3	56.9	48.8	66.3
1852 ...	43.2	53.0	60.2	62.9	73.8	76.6	81.4	79.8	75.8	70.5	58.5	56.3	66.0
1853 ...	45.2	53.2	58.2	66.6	76.4	79.4	82.8	80.8	77.1	65.7	56.5	54.2	66.5
1854 ...	40.8	53.1	62.7	62.8	73.4	76.6	82.1	82.4	78.9	67.9	56.3	47.8	65.6
1855 ...	51.1	47.0	54.9	65.3	73.0	76.4	81.8	82.1	79.3	64.9	62.0	53.2	66.0
1856 ...	39.4	47.6	53.0	65.2	72.9	81.5	83.0	81.9	74.6	65.4	59.4	49.1	64.4
1857 ...	41.7	58.4	53.6	58.2	71.1	79.4	78.3	80.2	76.0	63.3	57.8	57.7	64.6
1858 ...	55.8	47.9	56.0	65.5	73.0	79.3	81.2	81.4	73.7	70.1	53.1	57.8	66.6
1859 ...	50.8	55.7	61.6	64.5	71.5	78.0	79.9	78.0	76.2	65.0	60.0	52.9	66.2
1861 ...	51.3	54.9	57.2	62.8	72.0	78.8	82.4	80.3	[75.8]	68.8	[58.1]	[51.9]	[65.4]
1871 ...	38.2	54.7	62.5	67.5	72.8	80.5	82.1	79.6	72.6	68.5	58.1	48.6	65.5
1872 ...	45.2	48.2	52.1	64.7	74.7	79.8	84.9	81.9	77.5	64.8	53.6	45.1	64.4
1873 ...	47.4	53.3	53.2	64.6	73.0	78.3	81.2	80.3	75.6	63.4	54.4	50.7	64.6
1874 ...	46.8	50.8	59.9	65.3	71.4	80.9	79.1	78.9	75.6	60.1	58.1	52.2	65.7
1875 ...	49.6	49.1	57.0	60.8	71.0	78.1	84.6	79.5	74.7	62.8	59.2	53.4	64.8
1876 ...	55.4	54.2	56.2	64.1	71.4	80.2	83.9	82.5	77.4	62.0	55.6	43.4	65.5
1877 ...	50.7	50.5	56.2	62.8	68.8	80.4	83.6	81.9	76.8	68.7	58.8	53.5	66.1
1878 ...	49.7	51.6	61.8	67.0	74.3	78.4	83.1	82.9	77.0	66.9	57.2	48.6	66.5
1879 ...	49.6	49.3	59.8	63.6	76.3	78.8	83.2	79.5	74.1	70.0	58.5	57.9	66.7
1880 ...	58.3	56.4	61.7	67.0	73.7	80.6	83.4	81.4	75.8	65.9	53.5	48.6	67.2
1881 ...	56.8	51.9	64.4	60.4	72.9	81.7	83.4	81.0	78.7	72.0	60.0	55.5	66.8
1882 ...	55.1	57.3	62.0	66.6	71.6	79.3	81.4	81.7	76.5	69.5	55.4	48.5	67.1
1883 ...	51.4	57.0	53.8	64.0	70.8	80.0	83.4	79.9	74.3	69.0	59.4	56.0	66.6
1884 ...	46.6	58.7	59.8	63.3	74.8	75.3	82.2	78.9	77.2	71.2	59.4	53.7	66.7
1885 ...	50.7	47.5	52.2	63.8	72.7	79.5	81.9	80.9	76.0	65.2	58.6	50.4	66.0
1886 ...	47.8	47.9	53.9	62.4	72.8	77.3	79.9	78.2	74.0	66.5	57.1	48.4	63.6
1887 ...	45.6	56.7	54.8	62.6	72.7	77.5	81.7	80.2	74.0	66.5	56.2	51.0	64.9
1888 ...	51.6	47.4	55.0	65.6	72.3	78.2	78.5	79.7	74.0	64.2	56.3	47.2	64.7
1889 ...	51.6	47.4	55.0	63.5	73.6	76.8	81.4	78.0	75.8	64.7	60.0	60.0	65.8
1890 ...	59.3	60.6	56.4	64.8	73.0	82.2	79.8	78.0	76.2	67.6	62.2	51.4	67.8
Mean ..	49.9	52.8	58.2	65.0	73.0	79.2	81.4	80.3	75.8	66.7	58.1	51.9	66.0

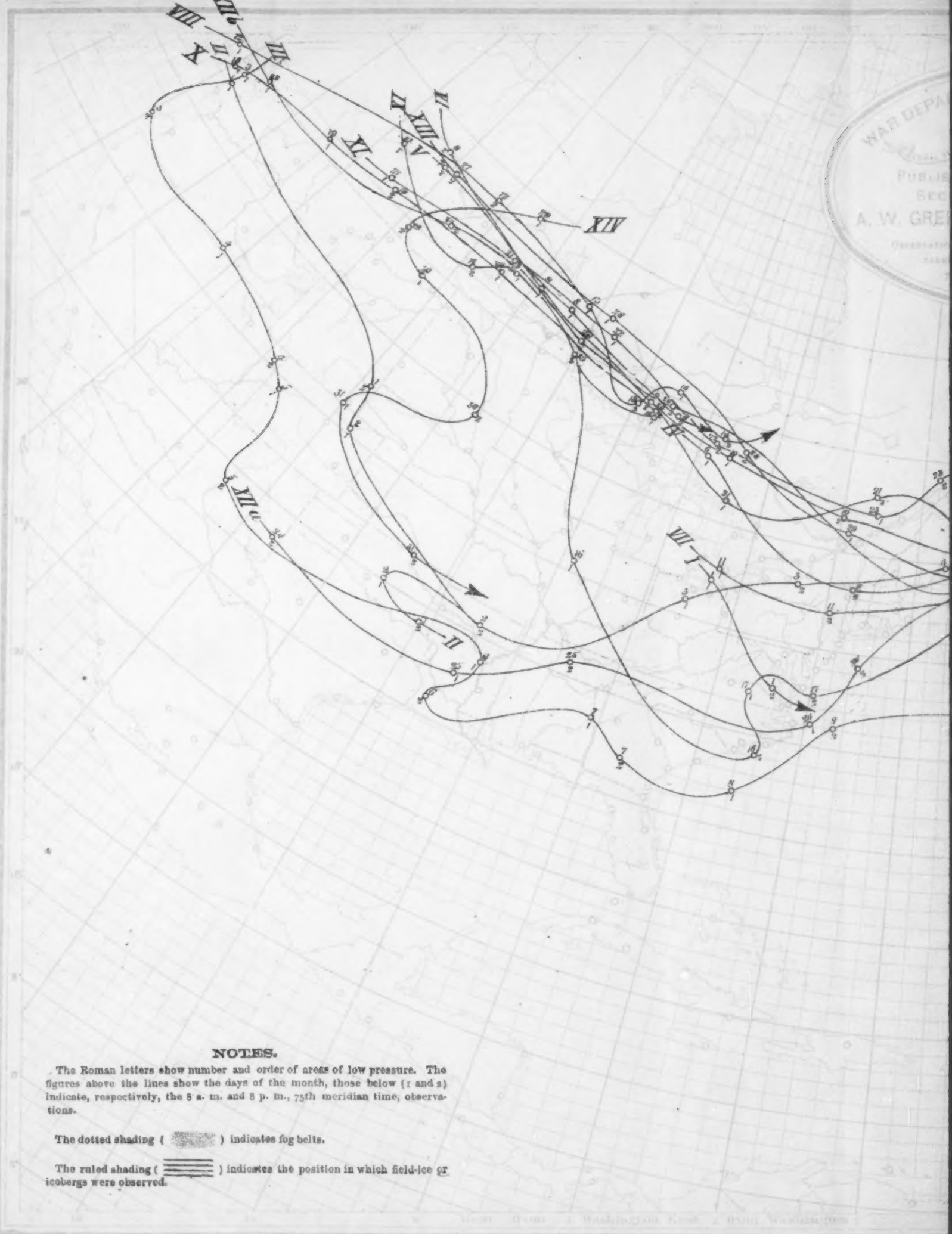
Table of miscellaneous meteorological data for December, 1890—Signal Service observations.

Stations and districts.	Elevation above sea-level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.										Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.			Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	8 a. m. Average cloudiness, tenths.		Length of record, years.	Precipitation data since opening of station.				
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.	Total movement, miles.	Prevailing direction.					Maximum velocity.		Direction.					Date.	8 a. m.		8 p. m.	Greatest for month.	Year.		
																			Miles per hour.	Direction.													
New England.																																	
Eastport	53	29.86	29.92	1.49	17.6	-8.4	52	26.2	-10	9-1	33	6	9-0	69.5	2.62	-1.66	10,971	nw.	54	so.	27	8	10	13	13	5.4	4.0	18	8.63	1884	1.11	1875	
Portland	99	29.88	29.99	1.39	17.2	-11.8	41	25.1	-4	9-4	36	5	9-0	75.4	5.08	-1.64	6,547	nw.	36	nw.	18	10	9	12	15	5.2	4.2	20	6.79	1881	0.97	1874	
Manchester	247	29.75	30.03	1.24	19.2	-	44	28.3	-5	10-1	36	5	10-7	74.0	3.30	-	5,109	n.	36	nw.	18	12	9	10	13	5.1	4.4	4	3.01	1889	2.09	1888	
Northfield	872	29.05	30.08	1.18	8.9	-	41	18.0	-22	0-2	42	4	2-9	73.8	1.91	-	6,904	n.	48	nw.	18	2	13	16	10	6.0	6.2	4	5.88	1887	1.91	1890	
Boston	125	29.88	30.02	1.23	26.0	-6.0	56	34.2	0	17-8	40	8	18-0	75.0	4.76	+1.45	11,148	nw.	54	nw.	17	10	9	12	10	6.0	4.6	31	6.76	1876	0.75	1875	
Nantucket	14	30.00	30.01	1.21	31.1	-	52	38.1	11	24-1	31	4	37-3	83.4	2.70	-	17,166	nw.	48	nw.	26	10	12	14	16	5.1	4.4	5	4.93	1886	2.07	1889	
Wood's Holl	22	30.00	30.01	1.21	29.2	-	54	37.3	6	21-2	39	5	3-90	-	3.90	+0.59	16,082	nw.	60	nw.	19	8	11	12	11	5.0	13	5	6.23	1873	1.36	1877	
Vineyard Haven	27	30.01	30.04	1.14	31.9	-	54	37.3	11	21-8	36	7	2-54	-	2.54	-	16,899	nw.	82	nw.	17	14	8	9	12	11	5.0	11	5	6.33	1887	1.76	1889
Block Island	27	30.01	30.04	1.14	31.4	-4.6	54	38.4	10	24-3	39	7	33-1	70.9	2.57	-1.69	16,899	nw.	82	nw.	17	14	8	9	12	11	5.0	11	5	6.33	1887	1.76	1889
Narragansett Pier	22	30.01	30.04	1.14	29.0	-4.0	55	39.8	4	18-3	45	10	5-09	-	5.09	+1.10	-	nw.	82	nw.	17	14	8	9	12	11	5.0	11	5	6.33	1887	1.76	1889
New Haven	107	29.93	30.05	1.15	26.6	-5.4	51	33.9	5	19-4	39	4	17-6	73.4	2.90	-0.78	7,388	nw.	52	nw.	17	12	9	10	13	5.0	5.4	19	6.34	1884	2.25	1885	
New London	47	29.98	30.03	1.10	29.4	-5.4	51	33.9	5	22-5	42	4	17-7	63.8	3.03	-0.34	7,187	nw.	36	nw.	17	10	11	10	11	5.7	4.7	20	7.36	1884	1.39	1877	
Mid. Atlantic States.																																	
Albany	85	29.93	30.09	1.22	19.8	-	46	26.9	-2	12-8	31	2	14-0	78.0	2.94	-0.92	9,934	nw.	30	nw.	17	3	17	11	14	3.5	1.7	16	6.16	1878	0.71	1877	
New York City	185	29.86	30.07	1.09	31.4	-3.6	54	38.4	13	24-3	37	8	20-9	71.0	5.43	-2.12	13,223	nw.	48	nw.	17	7	16	8	13	5.3	5.0	21	6.66	1884	0.95	1877	
Harrisburg	377	29.68	30.11	1.08	29.4	-	55	35.3	14	23-0	33	4	22-8	77.6	2.42	-	6,281	n.	64	nw.	17	10	8	13	12	3.0	4.9	3	2.50	1888	2.11	1889	
Philadelphia	117	29.97	30.10	1.20	32.2	-3.8	52	38.3	17	26-0	26	5	21-5	89.2	2.33	-0.48	9,670	nw.	48	nw.	17	9	7	15	13	5.5	4.5	20	5.05	1887	0.83	1877	
Atlantic City	53	30.03	30.08	1.19	33.6	-4.4	54	39.8	17	27-3	30	6	28-0	80.1	3.33	-0.78	104,53	nw.	48	nw.	17	14	7	10	15	5.0	4.0	18	8.20	1880	0.25	1889	
New Brunswick	76	30.00	30.09	1.16	29.0	-	50	36.3	25	31	25	3	3-51	-	3.51	-	-	nw.	39	nw.	17	7	11	13	11	4.0	4.0	20	5.90	1881	0.61	1889	
Baltimore	112	29.99	30.12	1.17	34.2	-1.8	60	40.9	18	25-4	24	5	22-4	85.3	2.67	-0.57	4,440	nw.	39	nw.	17	7	13	8	10	6.0	4.3	20	5.90	1881	0.61	1889	
Washington City	112	29.99	30.12	1.17	34.2	-1.8	60	40.9	18	25-4	24	5	23-4	70.8	3.74	-0.62	6,215	nw.	45	nw.	17	10	9	12	13	6.6	4.5	21	6.02	1878	0.19	1889	
Cape Henry	685	29.36	30.13	1.26	42.5	-	62	50.4	24	34-6	26	6	4-41	-	4.41	-0.24	-	nw.	45	nw.	17	10	10	11	10	6.0	4.6	20	7.18	1887	0.27	1889	
Lynchburg	43	30.07	30.13	1.23	38.2	-	62	46.2	19	30-3	29	3	24-2	85.6	5.14	-1.41	4,169	nw.	45	nw.	18	9	14	8	11	5.0	4.6	20	11.51	1884	0.51	1889	
Norfolk	43	30.07	30.13	1.23	41.4	-1.6	64	48.9	25	33-3	31	5	34-5	84.9	6.01	-2.68	7,359	n.	43	nw.	18	14	9	8	9	5.7	3.2	20	6.09	1882	0.77	1889	
S. Atlantic States.																																	
Charlotte	808	29.27	30.14	0.99	42.9	-0.2	68	52.2	24	33-6	31	3	31-1	71.2	3.81	-1.31	3,735	nw.	24	n.	27	21	2	8	8	3.6	4.0	13	6.55	1876	0.48	1889	
Hatteras	11	30.11	30.13	1.09	47.0	-0.0	67	53.5	31	40-6	26	5	40-8	80.8	6.01	-0.36	11,848	n.	42	nw.	28	19	6	6	10	4.5	2.7	17	13.38	1877	0.26	1889	
Kitty Hawk	78	30.06	30.15	1.00	46.4	-	67	53.8	38	39-1	23	8	3-34	-	3.34	-1.95	-	n.	36	nw.	28	16	7	11	11	4.0	4.2	17	8.02	1877	0.30	1889	
Raleigh	388	29.70	30.14	1.16	41.3	-	67	50.1	23	32-5	29	4	28-8	67.4	3.57	-	5,061	nw.	27	nw.	13	15	5	11	8	5.0	4.2	4	4.99	1887	0.60	1889	
Southport	78	30.06	30.15	1.00	46.4	-0.6	67	54.7	26	38-1	26	9	1-34	-	1.34	-2.42	6,976	n.	36	nw.	29	20	3	8	10	5.0	4.0	16	4.78	1887	0.10	1889	
Wilmington	52	30.10	30.15	0.76	47.4	-0.6	74	57.1	26	37-7	34	7	37-4	78.8	6.51	-3.07	6,972	n.	36	nw.	18	16	6	9	7	4.3	3.7	20	7.13	1877	0.15	1889	
Charleston	52	30.10	30.15	0.76	51.4	-0.4	75	59.4	34	43-3	27	5	43-7	73.8	1.01	-2.81	6,927	n.	30	nw.	17	21	3	7	5	3.3	3.3	20	7.91	1887	0.03	1889	
Columbia	183	29.99	30.10	0.76	46.0	-	68	57.1	25	35-0	30	10	1-57	-	1.57	-	-	nw.	24	n.	21	5	5	5	6	3.5	4.6	21	3.73	1887	0.75	1889	
Augusta	87	30.06	30.18	0.66	51.8	-0.6	71	59.2	28	39-1	34	5	36-8	74.6	1.18	-2.69	2,594	n.	24	n.	17	14	9	8	6	3.5	4.6	21	5.98	1871	0.55	1889	
Savannah	87	30.06	30.18	0.66	51.8	-0.6	71	59.2	28	39-1	34	5	40-2	73.8	2.92	-0.82	5,405	n.	36	n.	17	18	6	7	8	3.5	2.5	20	7.99	1887	T.	1889	
Jacksonville	43	30.14	30.19	0.50	55.9	-0.1	80	66.1	30	42-7	29	2	45-6	78.6	1.37	-1.92	4,949	n.	40	n.	17	14	11	6	6	3.4	2.4	20	7.76	1887	T.	1889	
Florida Peninsula.																																	
Jupiter	28	30.13	30.16	0.37	64.7	-	82	72.0	44	57-4	23	7	57-7	82.0	2.66	-	6,680	nw.	23	nw.	17	13	15	3	9	2.3	3.0	3	3.26	1888	0.36	1889	
Key West	22	30.15	30.17	0.30	68.2	-1.8	80	71.7	56	50-6	11	2	60-6	78.0	0.36	-1.60	8,234	n.	39	nw.	17	19	11	1	1	4.4	2.0	21	4.50	1879	0.27	1874	
Mico	36	30.17	30.21	0.38	61.0	-	82	71.2	38	50-9	37	7	0-93	-	0.93	-	-	n.	39	nw.	17	19	11	1	1	4.4	2.0	21	4.50	1879	T.	1889	
Tampa	36	30.17	30.21	0.38	60.6	-	81	69.8	31	51-5	30	6	50-8	80.2	1.33	-	3,903	n.	30	n.	17	17	11	3	5	3.4	1.4	20	9.08	1888	0.03	1889	
Titusville	44	30.14	30.18	0.40	60.4	-	82	68.3	38	52-4	28	3																					

Table of miscellaneous meteorological data for December, 1890—Signal Service observations—Continued.

Stations and districts.	Elevation above level, feet.	Pressure, in inches.			Temperature of air, in degrees Fahrenheit.								Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal precipitation.	Wind.				Total movement, miles.	Prevailing direction.	Maximum velocity.		Date.	Cloudless days.	Partly cloudy days.	Cloudy days.	Days with rainfall.	Average cloudiness, tenths.	Precipitation data since opening of station.			
		Mean actual.	Mean reduced.	Monthly range.	Monthly mean.	Departure from normal.	Maximum.	Mean maximum.	Minimum.	Mean minimum.	Greatest daily range.	Least daily range.					Miles per hour.	Direction.	Length of record, years.	Greatest for month.			Year.	Least for month.							Year.			
<i>Extreme Northwest.</i>																																		
Moorhead.....	935	29.01	30.70	0.97	19.1	-9.1	47	29.6	-15	8.6	36	6	11.0	78.6	0.23	-0.42	8,276	se.	44	nw.	26	16	11	4	34	3	1.5	10	1.74	1887	0.05	1890		
Salut Vincent.....	804	29.13	30.05	1.13	19.0	-14.0	52	29.6	-27	8.4	36	5	10.8	74.6	0.23	-0.29	6,695	se.	36	nw.	22	8	15	4	44	7	4.3	11	2.40	1889	0.23	1890		
Bismarck.....	1,681	28.22	30.09	0.87	24.9	-10.9	64	36.6	-7	13.2	41	6	20.3	90.1	0.22	-0.51	7,002	nw.	58	nw.	26	21	5	5	53	3	2.2	17	1.71	1884	0.06	1881		
Fort Buford.....	1,900	27.96	30.05	0.99	26.0	-14.0	56	36.5	-12	15.4	33	6	14.8	68.1	0.04	-0.64	6,740	nw.	60	nw.	26	11	12	5	35	0	4.7	12	3.08	1880	0.04	1890		
Fort Yates.....					25.8	-9.8	53	36.5	-9	14.8	34	8			0.70	-0.05																		
<i>Upper Miss. Valley.</i>																																		
Minneapolis.....					26.4	-1.4	54	35.8	-1	17.1	32	6			0.18	-0.18																		
Red Wing.....	758	29.26	30.13	0.95	24.2	-6.2	53	31.8	-6	16.7	33	6			0.15	-0.15	6,484	se.	48	nw.	26	14	7	10	43	7	3.2	21	2.69	1880	0.10	1890		
Saint Paul.....	831	29.16	30.09	0.94	24.0	-6.0	53	32.0	-3	16.0	31	5			0.10	-0.17	5,223	se.	29	nw.	26	9	14	8	63	9	3.1	21	2.52	1888	1.05	1889		
La Crosse.....	736	29.32	30.15	0.90	26.6	-3.6	52	35.0	-2	18.1	31	6			0.38	-0.94	4,227	se.	30	nw.	11	13	8	10	44	3	3.1	19	3.43	1875	0.10	1872		
Davenport.....	613	29.47	30.16	0.89	30.4	-3.4	57	37.9	-6	22.9	33	5			0.16	-0.94	7,132	nw.	38	sw.	26	14	6	11	64	8	3.1	20	3.84	1873	0.36	1870		
Des Moines.....	869	29.19	30.14	1.00	32.3	-7.3	60	42.0	-3	22.6	36	7			0.11	-1.47	6,467	nw.	36	sw.	13	21	6	4	33	4	2.3	13	2.50	1882	0.11	1890		
Dubuque.....	651	29.40	30.14	0.88	27.3	-3.3	53	34.5	-1	20.1	31	3			0.10	-1.10	2,124	nw.	25	w.	26	10	12	9	65	2	3.4	18	4.08	1884	0.52	1876		
Keokuk.....	613	29.50	30.18	0.96	33.8	-4.8	57	41.7	-13	25.8	32	4			0.23	-0.13	4,735	sw.	35	n.	26	15	8	5	24	3	3.6	20	8.56	1873	0.03	1890		
Cairo.....	359	29.78	30.18	0.81	40.0	-2.0	63	46.7	-20	33.3	27	4			0.21	-0.62	6,303	sw.	35	n.	12	13	5	13	10	5	1.3	20	8.99	1884	0.73	1876		
Springfield, Ill.....	644	29.43	30.14	0.86	34.0	-2.0	60	42.2	-14	25.7	30	6			0.26	-2.64	7,934	sw.	34	w.	27	13	11	7	34	8	4.5	12	5.19	1884	0.26	1890		
Saint Louis.....	571	29.59	30.19	0.89	37.6	-2.6	63	44.3	-17	31.0	32	5			0.32	-1.15	9,461	sw.	36	nw.	27	11	11	9	74	2	3.4	21	6.18	1884	0.18	1876		
<i>Missouri Valley.</i>																																		
Columbia.....					37.4	-0.4	65	48.8	-7	26.1	42	10			0.38	-0.46	5,945	n.	33	n.	16	10	9	12	3	...	4.0	2	0.85	1889	
Kansas City.....	963	29.12	30.19	1.14	37.4	-0.4	68	45.7	-14	29.1	33	4			0.63	-0.71	6,712	sw.	38	nw.	26	17	6	8	43	3	4.3	3	0.79	1888	0.14	1889		
Springfield, Mo.....	1,356	28.70	30.18	0.94	40.0	-6.0	64	48.3	-11	31.7	34	2			0.95	-1.26	7,223	n.	38	nw.	16	13	9	9	55	1	3.5	5	2.52	1888	1.05	1889		
Leavenworth.....	842	29.27	30.19	1.14	37.0	+6.0	70	46.4	-12	27.7	37	4			0.40	-1.26	4,432	nw.	29	sw.	13	16	4	11	24	6	0.3	20	5.14	1873	0.08	1889		
Topeka.....					30.5	-1.5	71	48.9	-6	24.1	39	11			0.91	-0.91																		
Omaha.....	1,113	28.96	30.18	0.96	34.0	+9.6	71	44.5	-5	24.6	34	5			0.08	-0.95	5,351	se.	36	nw.	26	14	11	6	13	2	2.2	21	2.92	1870	0.08	1889		
Crete.....					34.5	-1.5	74	47.4	-5	21.6	43	9			0.30	-0.30																		
Valentine.....	2,613	27.34	30.18	0.90	32.2	-6.2	68	45.3	-1	19.2	43	8			0.32	+0.06	7,602	sw.	52	nw.	26	12	13	6	23	1	2.1	6	0.84	1889	0.10	1889		
Sioux City.....	1,158	28.86	30.17	0.92	31.5	-6.5	68	41.8	-3	21.2	38	4			0.05	-0.10	5,735	nw.	40	nw.	26	15	9	7	32	7	3.0	2	1.14	1889	0.10	1890		
Fort Sully.....	1,600	28.35	30.12	0.88	28.0	-6.0	62	38.4	-12	17.5	40	6			0.44	-0.05	6,144	nw.	54	nw.	26	10	14	7	53	9	3.8	13	1.18	1883	0.06
Huron.....	1,307	28.67	30.13	0.84	24.4	+6.4	54	36.1	-16	12.6	42	7			0.68	-0.02	7,402	se.	48	nw.	26	18	10	3	42	9	2.3	10	0.29	1887	0.06	1881		
Yankton.....	1,232	28.77	30.15	0.88	31.0	-8.0	67	43.9	-7	19.0	45	6			0.25	-0.55	6,714	nw.	54	nw.	26	17	12	2	42	8	2.6	18	2.40	1877	0.07	1885		
<i>Northern Slope.</i>																																		
Pt. Assiniboine.....	2,690	27.13	30.02	0.93	29.8	-10.8	56	39.1	-12	20.6	46	4			0.25	-0.45	11,874	sw.	72	sw.	21	9	7	15	5	6	2.6	12	1.61	1880	0.08	1881		
Fort Custer.....	3,040	26.84	30.07	0.76	31.4	-8.4	58	40.9	-7	22.0	46	4			0.25	-0.48	5,141	se.	40	nw.	15	11	8	12	1	...	6.6	11	1.87	1883	0.09	1885		
Helena.....	4,059	25.86	30.11	0.88	30.2	-6.2	54	36.8	-2	23.5	35	4			0.82	-0.33	3,738	sw.	60	w.	25	10	12	9	12	5	9.5	0	4.64	1880	0.18	1889		
Rapid City.....	3,280	26.64	30.13	0.89	33.6	-3.6	75	45.3	-3	21.8	37	7			0.17	-0.58	5,518	w.	42	n.	26	10	15	6	64	0	3.9	5	0.51	1888	0.00	1881		
Cheyenne.....	6,105	24.00	30.09	0.76	30.1	+7.1	61	47.0	-13	25.2	41	8			0.11	-0.11	9,562	nw.	46	w.	25	18	9	4	22	5	4.2	21	0.80	1883	0.01	1881		
Fort McKinney.....	5,000	25.02	30.15	0.90	34.8	-4.8	68	45.6	-5	24.1	41	9			0.03	-0.03	5,514	w.	50	n.	26	14	8	9	24	8	4.1	3	0.29	1888	0.25	1887		
Fort Washakie.....	5,580	24.49	30.17	0.79	28.7	-10.7	57	41.8	-3	15.6	40	15			0.03	-0.66	3,469	sw.	30	sw.	26	17	11	3	3	7	3.7	4	0.62	1889
North Platte.....	2,841	27.16	30.20	0.80	34.3	+7.3	70	50.2	-4	18.4	50	6			0.03	-0.66	6,051	w.	46	nw.	31	17	10	4	3	2	3.0	17	3.86	1877	0.03	1890		
<i>Mid-Missouri Slope.</i>																																		
Denver.....	5,281	24.80	30.14	0.80	39.3	+5.3	70	53.4	-14	25.2	46	5			0.04	-0.63	4,197	sw.	46	ne.	31	17	10	4	2	5	2.9	20	2.32	1883	0.00	1881		
Pueblo.....	4,753	25.30	30.22	0.81	36.8	-0.8	70	52.7	-9	20.9	52	2			0.06	-0.40	5,365	nw.	40	n.	31	15	14	1	0	...	3.2	1	0.16	1889
Concordia.....	1,410	28.66	30.22	0.98	36.4	-0.4	71	49.2	-8	23.6	40	5			0.06	-0.40	4,770	n.	28	n.	26	20	6	5	2	2	1.8	0	0.63	1887	0.01	1889		
Dodge City.....	2,523	27.48	30.20	1.10	38.8	+6.8	70	52.8	-10	24.8	40	5			0.14	-0.57	6,996	n.	47															

From 1891 to 1894



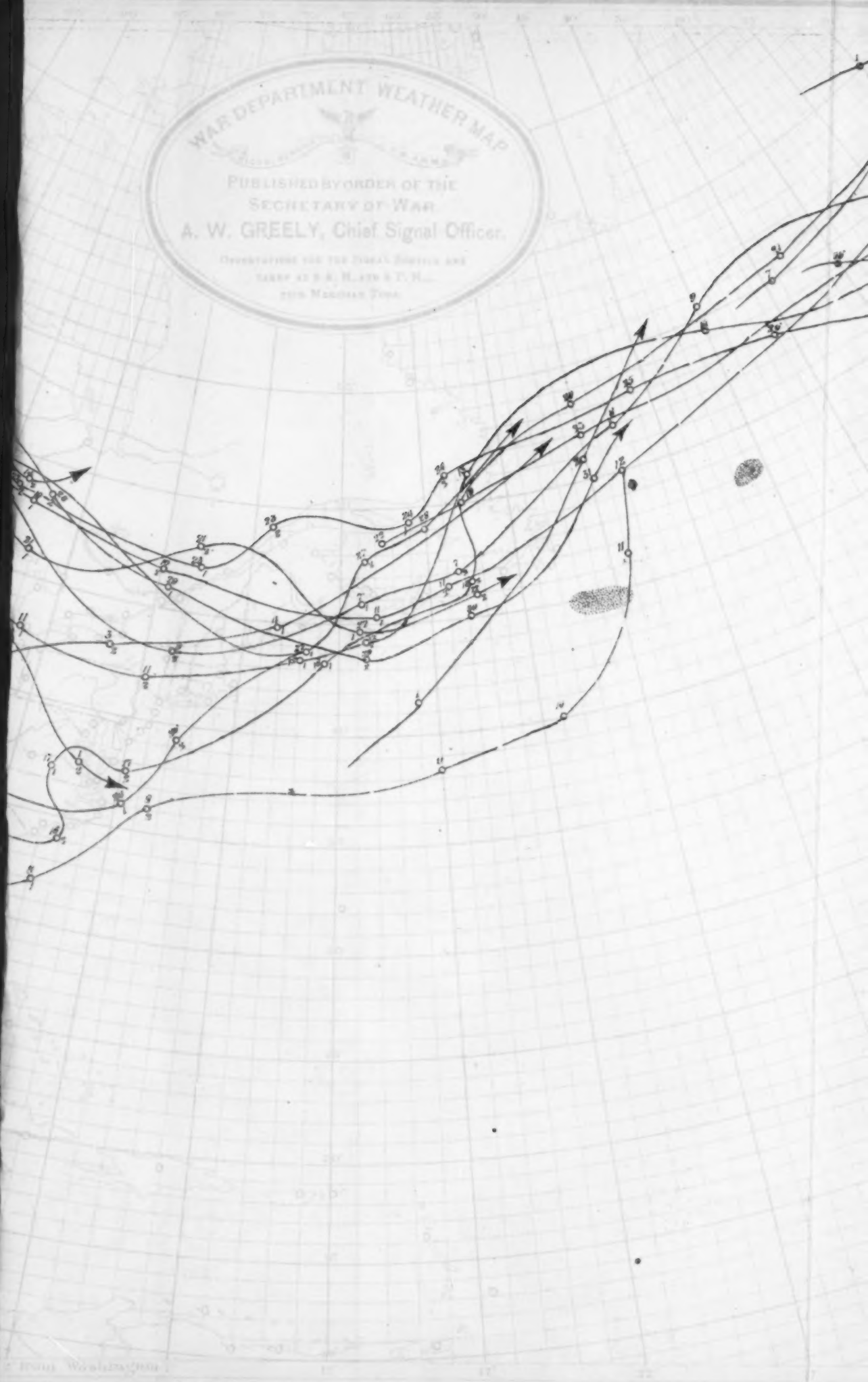
NOTES.

The Roman letters show number and order of areas of low pressure. The figures above the lines show the days of the month, those below (1 and 2) indicate, respectively, the 8 a. m. and 8 p. m., 75th meridian time, observations.

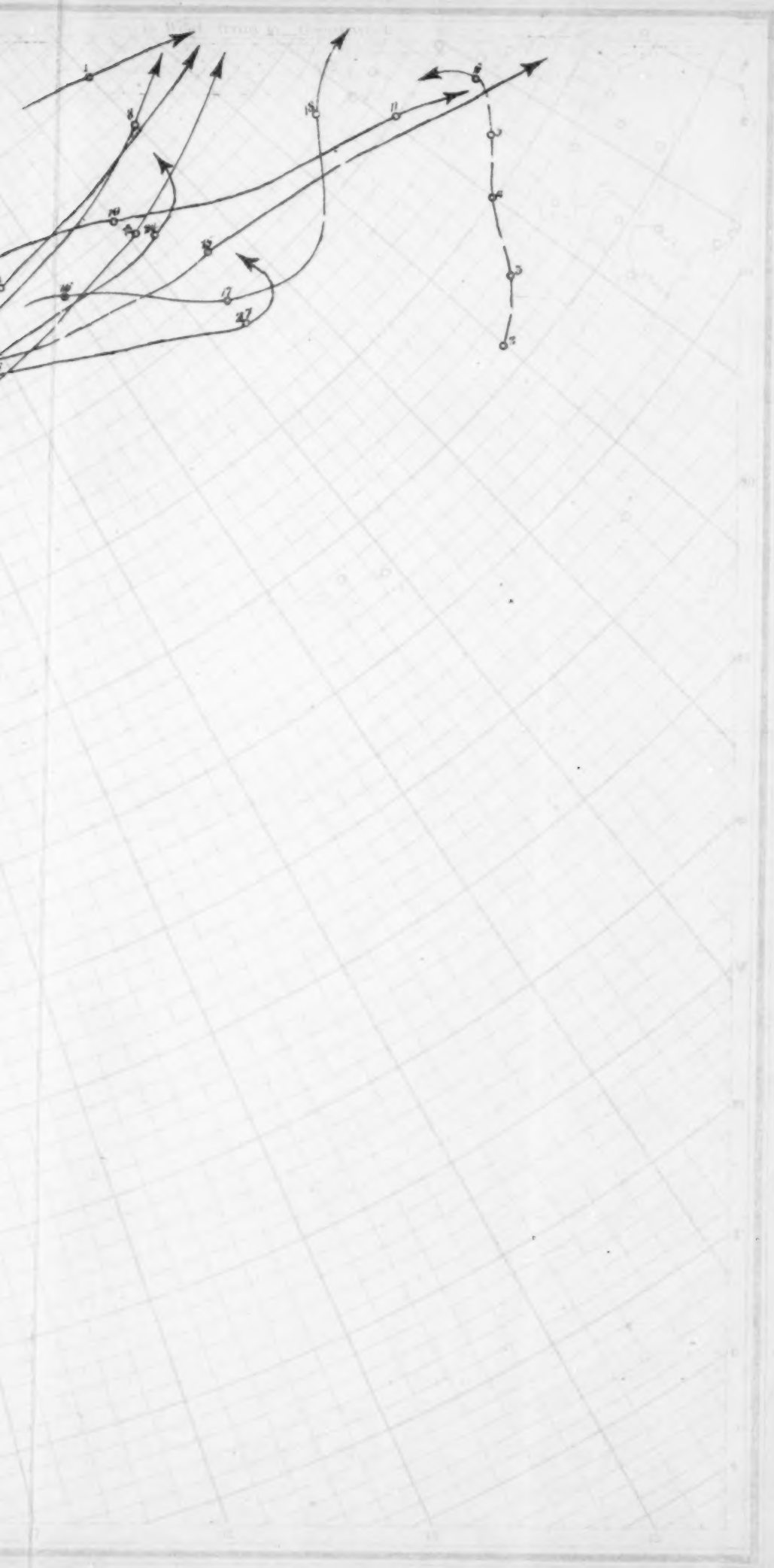
The dotted shading () indicates fog belts.

The ruled shading () indicates the position in which field-ice or icebergs were observed.

Chart I. Tracks of Areas of Low Pressure. December, 1890.



Handwritten text at the top of the page, possibly a title or date, which is mostly illegible due to fading.



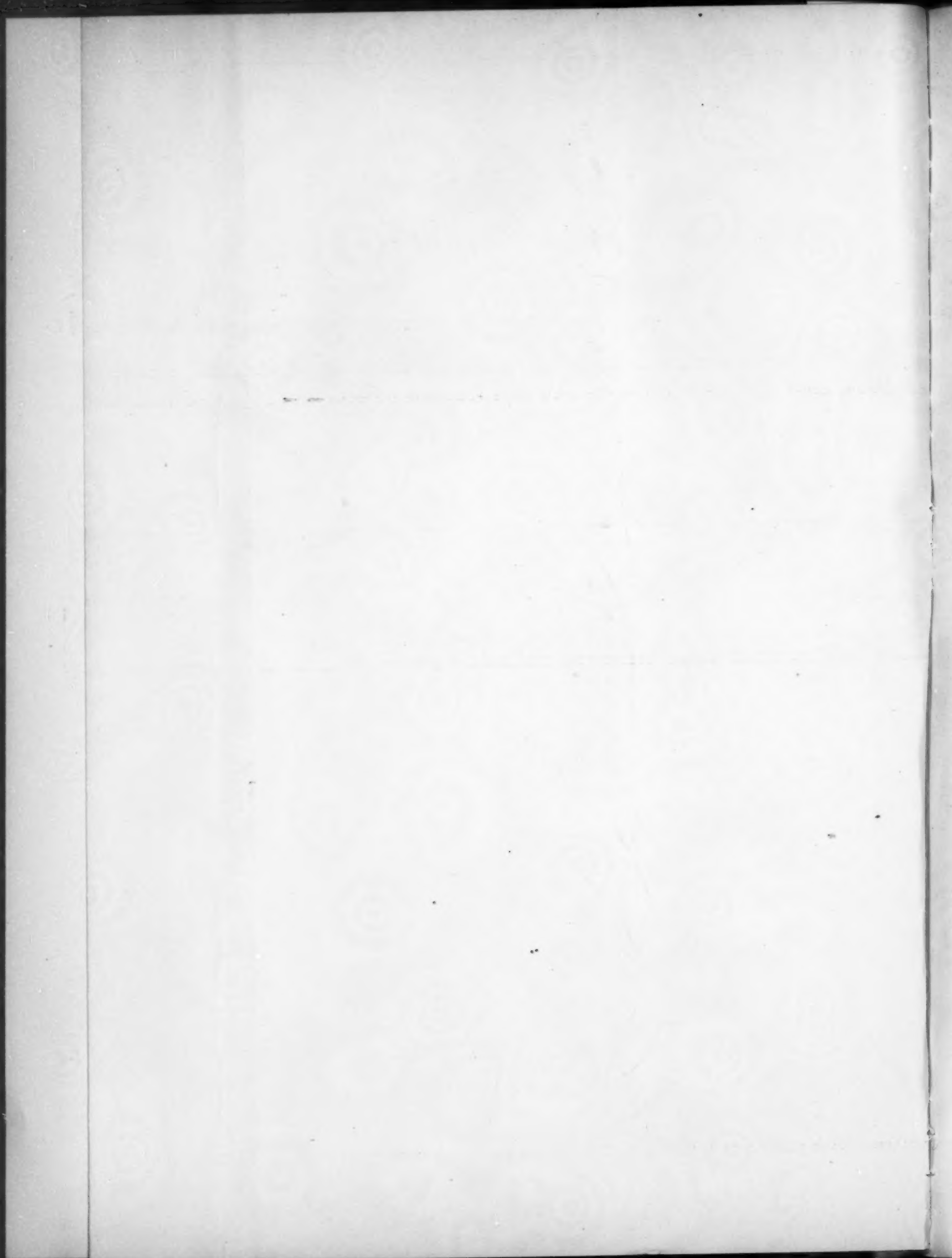


Chart II. Isobars, Isotherms, and Winds, December, 1890.

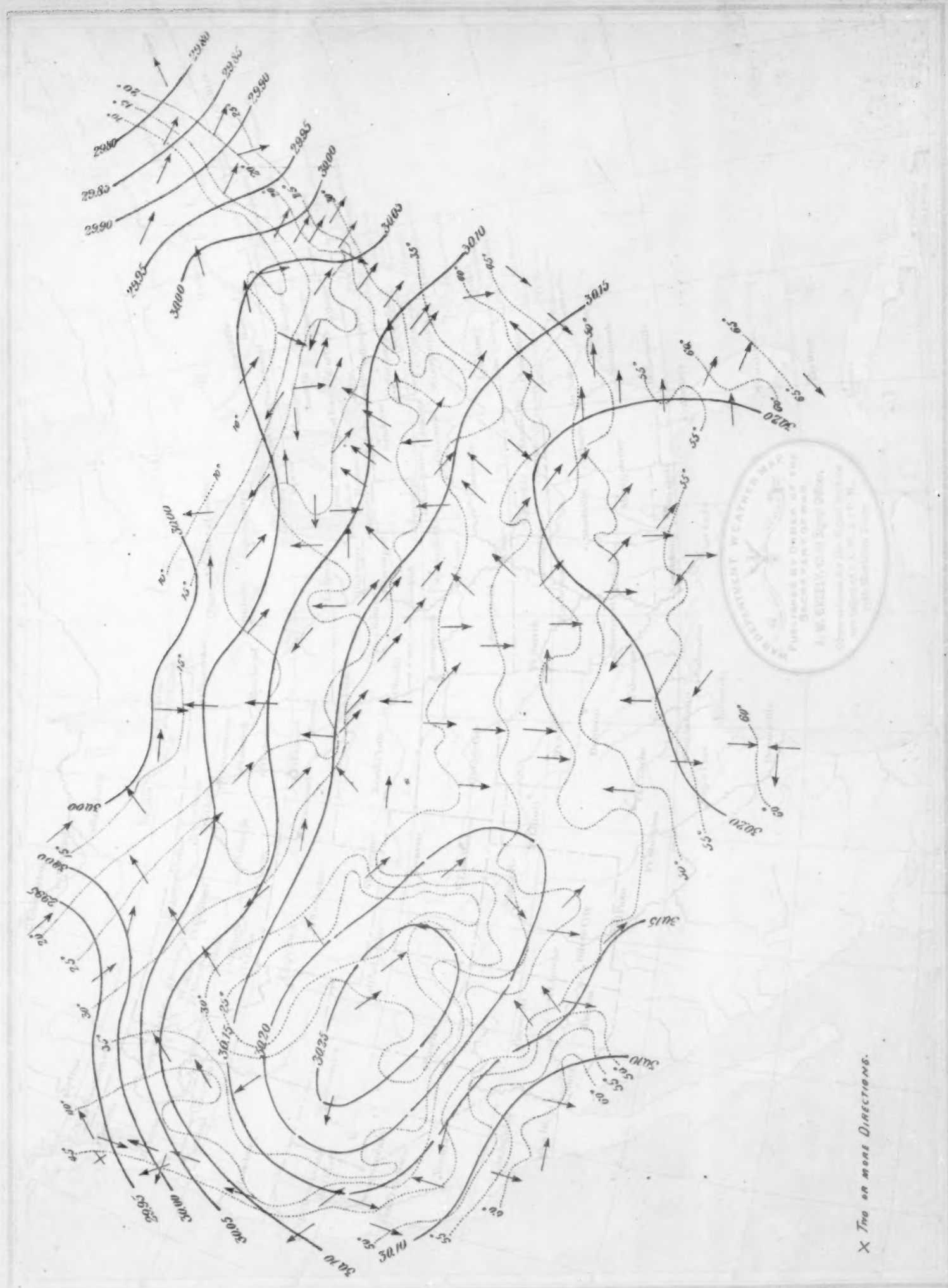


Chart III. Precipitation. December. 1890.



Chart IV. Depth of Snow (inches) reported on ground December 31, 1890, and Limits of Freezing Weather.



Chart V. Depth of Snowfall (inches). December, 1890.



List of voluntary observers of the Signal Service, who furnish meteorological reports for the Monthly Weather Review.

<p>Alabama. Prof P H Mell Auburn Ala Wm Fowler Bermuda Ala W J Holland Brewton Ala J G Michael Citronelle Ala W D Lovett Columbiana Ala A M Weiler Double Springs Ala W H Hawkins Evergreen Ala Prof C W Ashcroft Florence Ala M H Verby Greensborough Ala H Lamar Jasper Ala Prof J W A Wright Livingston Ala Wm Garrett Mount Willing Ala Post Surgeon (Mt Vernon Barracks) Mount Vernon Ala J F Cooper Pine Apple Ala L B Thornton Tuscumbia Ala R J Grady Union Springs Ala W H Neuman Uniontown Ala Dr E P Nicholson Valley Head Ala Alaska. Rev Eugene S Willard Juneau Alaska Jos Zuboff Killisnoo Alaska H S Tibbey Coal Harbor Unga Island Alaska Arizona. Mrs J H Hamilton Antelope Valley Ariz Geo Banghart (Bangharts) Chino Ariz Rev J G Pritchard Bisbee Ariz D D Ross (Chiracahua Mt) Tombstone Ariz E K Sykes Calabasas Ariz Ed Vanderlip Crittenden Ariz T C Bain Dos Cabezos Ariz Ellis McFall Dragoon Ariz George F Cook Dudleyville Ariz Dr R B Tripp (Eagle Pass) Fort Thomas Ariz Richard H Farley (Farley's Camp) Tip Top Ariz Post Surgeon Fort Apache Ariz Post Surgeon Fort Bowie Ariz Post Surgeon Fort Grant Ariz Post Surgeon Fort Huachuca Ariz Post Surgeon Fort Lowell Tucson Ariz A T Colton Florence Ariz D Murphy Gila Bend Ariz E W Perkins (Fairbank) Grand Central Mill Ariz</p>	<p>D Rope Holbrook Ariz F M Zuck Holbrook Ariz Mrs Alice F Cameron Lochiel Ariz Henry P Ewing Mineral Park (Chloride) Ariz J W Stump (Mt Huachuca) Tombstone Ariz F T Alkire (New River) Phoenix Ariz George W Wells (Oro) Clifton Ariz G W Bonacker Payson Ariz Cortez Cox (Ariz Canal Co's dam) Phoenix Ariz Post Surgeon Whipple Barracks Prescott Ariz W A Langhorne Red Rock Ariz D D Gowan care F H Nash Strawberry Ariz G M Adams Show Low Ariz H Koshland Signal Ariz Post Surgeon San Carlos Ariz David K Udall Springerville Ariz L P Nash Strawberry Ariz C W Miller Tempe Ariz Miss Mary Tevis Teviston Ariz H V Wager Tip Top Ariz. J S Robbins (Ash Canyon) Tombstone Ariz S C Bagg Tombstone Ariz E L Wetmore Tucson Ariz T B Carter Walnut Grove Ariz F W Heyne (Walnut Ranch) Powers Ariz C P Smith Wilgus Ariz T D Bridger (Wood Canon) San Simeon Ariz G B Gardiner Woodruff Ariz Arkansas. R B Smith Camden Ark A P Robinson Conway Ark T M Carder Dallas Ark B J Wilson Devalls Bluff Ark J H Bard Forrest City Ark Post Surgeon U S A Hot Springs Ark Prof R L Gowan Harrisburgh Ark W H Pyburn Lonoke Ark M F Locke Com of Agriculture Little Rock Ark Sgt F H Clark Little Rock Ark J L Adams Malvern Ark</p>	<p>Joseph Evins Mount Nebo Ark Alex Goodrich Osceola Ark Geo Bradley Ozone Ark Nettie Hollibaugh Pine Bluff Ark Dr E L Buerkle Stuttgart Ark M J Nash Texarkana Ark A H Carrigan Washington Ark A Dunlap Winslow Ark California. H L Fry Arcata Cal Post Surgeon Alcatraz Island Cal Dr A Fouch Anderson Cal Post Surgeon (Angel Island) San Francisco Cal Post Surgeon (Benicia Barracks) Benicia Cal Geo R Gooding Barstow Cal Prof F Soule Berkeley Cal S E Gaskill Campo Cal Wm Barry (Centreville) Niles Cal Seward Cole Colegrove Cal D S Sartwell Crescent City Cal S Holland Evergreen Cal Post Surgeon Fort Gaston Hoopa Valley Cal Post Surgeon Fort Mason San Francisco Cal C M Fitzgerald Georgetown Cal B F Berriman Grass Valley Cal E T Foss Hydesville Cal C F Macey Iowa City Cal W A Sickler Julian Cal Jos Dominici La Grange Cal F H McCullagh Los Gatos Cal Prof A J Burnham Lick Observatory San Jose Cal Ed Wesson Milton Cal Director Chabot Obs'y Oakland Cal E V Maslin (Loomis) Pino Cal R Rowland Placerville Cal W E Keith Riverside Cal S H Gerrish 1517 G street Sacramento Cal Dr E K Abbott Salinas Cal Post Surgeon Presido of San Fran San Francisco Cal Hugh D Vail Santa Barbara Cal</p>	<p>Post Surgeon San Diego Barracks San Diego Cal H Block Santa Clara Cal W R Springer Santa Cruz Cal L E Blochman Santa Maria Cal Robert Hall Sonoma Cal A T Mason (Steeles) Edna Cal T B Sanders Susanville Cal J E Boal (Sweetwater Dam) National City Cal W H Roscoe Upper Mattole Cal G O Colburn Vacaville Cal A Widmann Volta Cal J Titcomb (Walla Walla Creek) Fort Jones Cal A L Bancroft Walnut Creek Cal Wm Lumbard Wheatland Cal A W Sehorn Willow Cal R H Piatt Woodland Cal Colorado. S T Shipman Abbott Colo James Hardins Alford Colo C A Montrose Alma Colo Mrs I Rogers Apishapa Colo L Powell Agate Colo R G Taylor Amherst Colo W L Doyle Aroya Colo J H Weller Brandon Colo L A Rawlings Box Elder Colo Dr B A Arbogast Breckenridge Colo Agent U P R R Byers Colo Rev G C Huntington Brush Colo G E Lake Boulder Colo J M Boice Crook Colo W Holcomb Castle Rock Colo W B Felton Canon City Colo Jasper Walker Chromo Colo G C Wortman Climax Colo A Reicheneker Como Colo Agent U P R R First View via Cheyenne Wells Colo G W Close Cumbres Colo Miss M Zaninnetti Delta Colo Sgt W S Miller Denver Colo Agent U P R R Deer Trail Colo</p>	<p>S S Pratt Dillon Colo A W Wing (Eagle Farm) Pueblo Colo R C Boyle Elkhorn Colo C H Mather Emma Colo Miss Grace Birdsall Experimental Station Fort Collins Colo Prof L G Carpenter Fort Collins Colo Post Surgeon Fort Lewis Colo Post Surgeon Fort Logan Colo Dr H W Slocum Fort Morgan Colo Dr T H Breen Fruita Colo Dr W A Jayne Georgetown Colo John Pritchard Greenhorn Colo E P Moon Husted Colo Agent U P R R Hugo Colo L E Loveland Julesburg Colo Mrs N R Walters Kirk Colo Agent U P R R Kit Carson Colo G T Herbert Lamar Colo A G Wallihan Lay Colo J C Carroll Leadville Colo Chas Green Le Roy Colo John Pearce Livermore Colo Dr E J Clark Longmont Colo W E Culver Las Animas Colo M M Sprague Moraine Colo H C Gould Morrison Colo Agent U P R R Magnolia Colo L A Wickoff Minneapolis Colo C J Aldrich Monte Vista Colo J M Wadsworth Pagoda Colo J C Strawn Pagosa Springs Colo Dr Thomas Gaddis Palmer Lake Colo L S Kelly Parachute Colo H Y Nichols Peyton Colo Miss Lucy Bell Pinkhampton Colo H W Goodrich Red Cliff Colo G D Yokum Rico Colo Agent U P R R River Bend Colo F Watrous Rocky Ford Colo C F Woods Saint Clouds Colo G C Smith Sanborn Colo H H Griffin (San Luis Ex Sta) Del Norte Colo</p>
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E C Van Deist San Luis Colo	Wm Carnagy Kirkwood Del	J W Cowden Era Idaho	H A Burr Philo Ill	Prof J N Roe Valparaiso Ind
J D Lucas Sedgwick Colo	Florida. C E Robins Alva Fla	Post Surgeon Fort Sherman Sherman Idaho	Isaac Young Pontiac Ill	Prof C G Boerner Vevay Ind
O A Rusk Sheridan Lake Colo	A F Wyman Archer Fla	J C Soward Garden Valley Idaho	T D Robertson Rockford Ill	Dr W B Squire Worthington Ind
Geo Poehill Stamford Colo	Bennett P Ferrell Duke Fla	D McLoughlin Kootenai Idaho	Post Surgeon Rock Island Arsenal Rock Island Ill	Indian Territory. Post Surgeon Fort Supply Ind T
A F Spoor Sterling Colo	H W O Margary Eustis Fla	R Schleicher Lewiston Idaho	J W James (Riley) Marengo Ill	G H Heald Healdton Ind T
P Blumer (Thon) Elizabeth Colo	Post Surgeon (Fort Barrancas) Warrington Fla	G M Wilson Mullan Idaho	N T Veatch Rushville Ill	Iowa. M V Ashby Afton Iowa
L T Durbin Villa Grove Colo	A H Adams Fort Meade Fla	Dr F B Delano Payette Idaho	S C Lincoln Sandwich Ill	David E Hadden Alta Iowa
J T Kirkman Vilas Colo	J S Wade Homeland Fla	A H Soward Placerville Idaho	Dr M D Ewell (S Evanston) Room 52 97 Clark St Chicago Ill	J W Love Atlantic Iowa
M D Pierce Watervale Colo	H D Pierce Hypoluxo Fla	Ferdinand Alers Ruthberg Idaho	Sgt John Craig Springfield Ill	Conrad Schadt Amana Iowa
J R Pickett (T S Ranch) Whitewater Colo	Mrs Mary W Broberg Manatee Fla	Illinois. J W C Gray Atwood Ill	R Dow Sycamore Ill	J Rush Lincoln Ames Iowa
Agent U P R R Watkins Colo	Rev J H White (Merritts Id) Georgiana Fla	Dr M M Robbins Aurora Ill	Mable Coppernell Julia Roach (High School) Warren Ill	H N Renfrew Bancroft Iowa
T Charlton Westcliffe Colo	David S Woodrow Ocala Fla	W Holden Aurora Ill	H Upsall Watseka Ill	H W Van Dike Belle Plaine Iowa
J W Dilts Wray Colo	Dr Geo E Walton Orange City Fla	L H Sullivan Beason Ill	P J Bates White Hall Ill	James Rogers Blakeville Iowa
Ira Edwards Yuma Colo	J M Bourland Pine Level Fla	E L Lawrence Belvidere Ill	F Osborne Winnebago Ill	Moses Simon Carroll Iowa
Connecticut. H R Stevens (Birmingham) Stevenson Conn	Post Surgeon (St Francis Barracks) St Augustine Fla	J L Hallam Centralia Ill	Indiana. L Stealy Angola Ind	G N Ferguson Carson Iowa
G J Case Canton Conn	Paul R Gailmard San Antonio Fla	J B Dazey Charleston Ill	C F Hole Butler Ind	A C Page Cedar Falls Iowa
S P Willard Colchester Conn	Rev W H Carter Tallahassee Fla	J L Jaeger Cockrell Ill	Dr N I Kithcart Columbia City Ind	H D Olds Cedar Rapids Iowa
M H Dean Falls Village Conn	F S Parlow Villa City Fla	Dr J L R Wadsworth Collinsville Ill	J A Perry Columbus Ind	A S Van Sandt Clarinda Iowa
Post Surgeon Fort Trumbull New London Conn	Georgia. W P Briggs Athens Ga	H D Fisk Dwight Ill	R Hessler Connersville Ind	Luke Roberts Clinton Iowa
Rev S Hart Hartford Conn	Prof L H Charbonnier Athens Ga	C L Farrington East Peoria Ill	T E Huston Cannelton Ind	Gregory Marshall Cresco Iowa
W R Matson 47 Garden st Hartford Conn	Post Surgeon Fort McPherson Atlanta Ga	Post Surgeon Fort Sheridan Highwood Ill	J T De Munbrun Crandall Ind	Sgt George M Chappell Des Moines Iowa
J H Tucker Lebanon Conn	Prof D McWade Blakely Ga	J E Y Hanna Golconda Ill	J P White De Gonia Springs Ind	C A Schaffter Eagle Grove Iowa
E A Bailey Mansfield Conn	Wm Kimzey (Diamond) Roy Ga	Prof M S Oudyn Greenville Ill	Higginbotham & Son Delphi Ind	R Z Latimer Fayette Iowa
S T Frost Meriden Conn	T G Scott Forsyth Ga	C H Oakford Griggsville Ill	D A Owens Franklin Ind	Miss L A McCready Fort Madison Iowa
H D A Ward Middletown Conn	R L Rhodes Hephzibah Ga	A T Purviance Hennepin Ill	W J Davidson Farmland Ind	Seth Dean Glenwood Iowa
R R Smith New Hartford Conn	C W Meaders Gillsville Ga	Wm Rogan (Irishtown) Carlyle Ill	C R Kluger Huntingburgh Ind	J G Culver Greenfield Iowa
Rev Wm Goodwin New Hartford Conn	J E Howland Lithia Springs Ga	W J S Cathcart (Jordan's Grove) Marissa Ill	Sgt C F R Wappenhans Indianapolis Ind	Prof S J Buck Grinnell Iowa
T B Wheeler (Shelton) Birmingham Conn	G W Warren Louisville Ga	Rev A C Price Lacon Ill	J C Loomis Jeffersonville Ind	E C Grenelle Hampton Iowa
K B Loomis South Manchester Conn	G S Owen Marietta Ga	E E Jenkins Louisville Ill	Prof H A Huston La Fayette Ind	Miss Florence Prouty Humboldt Iowa
L Andrews Southington Conn	S A Cook Milledgeville Ga	C H Beeler Lanark Ill	D E Prior Logansport Ind	Emil F Wulfke Independence Iowa
Miss E D Larned Thompson Conn	G F Meriwether Monticello Ga	J B Sheapley Martinsville Ill	J M Johnson Marengo Ind	Prof J L Tilton Indianola Iowa
W H Rathbone Uncasville Conn	C M Witcher Point Peter Ga	Dr G Leibrock Mascoutah Ill	E Kirkwood Mauzy Ind	Prof A A Veblen Iowa City Iowa
Rev E Dewhurst Voluntown Conn	J F Wilson Poulan Ga	I Withington Mattoon Ill	J M Lockwood Mount Vernon Ind	Mrs M B Stern Logan Iowa
Mrs B F Harrison Wallingford Conn	J L Cutler Quitman Ga	W P Gibbs McLeansborough Ill	Stephen & Durham Muncie Ind	H B Strever Larrabee Iowa
N J Welton Waterbury Conn	R Thomas Jr Thomasville Ga	C H Fahs Olney Ill	E Jones Princeton Ind	W L Thompson Manson Iowa
S T Stockwell West Simsbury Conn	Hon A J Julian Woolley's Ford Ga	V E Phillips Olney Ill	J F Hood Point Isabel Ind	Dr A B Bowen Maquoketa Iowa
L H Healey North Woodstock Conn	Idaho. Frank Campbell American Falls Idaho	J S Seeley Oswego Ill	E J Mote Richmond Ind	H D Smith Monticello Iowa
District of Columbia Post Surgeon Washington Barracks Washington D C	Mrs Sarah Burnside Beaver Idaho	Dr J O Harris Ottawa Ill	Dr W N Wirt Rockville Ind	Dr Max E Witte Mt Pleasant Iowa
C L Washburn Deaf and Dumb Asylum Kendall Green Washington D C	A C Bomar Bonanza City Idaho	J E Templeton Palestine Ill	J A Forsythe Seymour Ind	Prof Alonzo Collins Mt Vernon Iowa
Delaware. John S Jester Dover Del	Post Surgeon Boise Barracks Boise City Idaho	J K Eberle Pana Ill	S B Morris Shelbyville Ind	Miss Ruby P Barr McCausland Iowa
		Dr F Brendel Peoria Ill	Prof R G Gillum State Normal School Terre Haute Ind	J P Walton Muscatine Iowa
				G D Pattingill Osage Iowa

Jos Boyd Oskaloosa Iowa	W L Belden Horton Kans	Agent U P R R Weskan Kans	Dr Wm Meyer Lake Charles La	McDonogh Institute McDonogh Md
Wm J Wicks Panama Iowa	J M Altaffer Independence Kans	Agent U P R R Winona Kans	Dr E A Crawford Liberty Hill La	Mt St Mary College Mt St Mary's Md
Dr Caleb Brown Sac City Iowa	Prof R Hay Junction City Kans	Agent U P R R Wallace Kans	M R Bein Luling La	Woodstock College Woodstock Md
A J Bond Storm Lake Iowa	Dr E R Heath 1115 Garfield Ave Kansas City Kans	Kentucky.	L J Dodge Melville La	Massachusetts.
T F McCune Vinton Iowa	C P Paddock Kingman Kans	H B Bonar Caddo Ky	W S Hunter Minden La	A B Wiggins Andover Mass
W A Cook Washington Iowa	Jacob Nixon Kellogg Kans	C H Major Canton Ky	Alex Band Mandeville La	Miss S C Snell Amherst Mass
Wm Ward Stilson Iowa	Dr W M Goodwin La Crosse Kans	Dr Melvin Rhorer Central City Ky	W W Renwick Monroe La	Hatch Experiment Station Amherst Mass
C M Trumbauer Webster City Iowa	Isaac S Coe La Harpe Kans	J B Atkinson Earlington Ky	L Molenar Marksville La	Ag'l Experiment Station Amherst Mass
P Dorweiler West Bend Iowa	C E Poling Larned Kans	Miss Lee Ray Edmonton Ky	R Benefield Maurepas La	Post Surgeon Fort Warren Boston Mass
Kansas.	Prof F H Snow Lawrence Kans	E C Went Frankfort Ky	James S Cosgrove Natchitoches La	Prof W H Niles Boston Mass
W P Gulick Abilene Kans	F R French Lakin Kans	T W McGill Franklin Ky	Mrs J A Gebert New Iberia La	Pvt J W Smith Boston Mass
J J Cass Allison Kans	C B Jennings Lebo Kans	Dr F L Harrod Harrodsburgh Ky	Sgt G E Hunt New Orleans La	Rev A K Teele (Blue Hill) Milton Mass
A H Goddard Alton Kans	Wm Graves Lincoln Kans	V E Muncey Lexington Ky	Post Surgeon Jackson Barracks New Orleans La	Prof A L Rotch (Blue Hill) Readville Mass
J W Gander Altoona Kans	C P Blachley Manhattan Kans	Sgt Frank Burke Louisville Ky	J E Le Blanc Paincourtville La	Dr F A Rogers Brewster Mass
H E Faidley Burr Oak Kans	C M Breese Agric'l Col Manhattan Kans	H C McKee Mt Sterling Ky	P G Kleinpeter Plaquemine La	Desmond Fitzgerald Brookline Mass
A R Henderson Buffalo Kans	R P Edgington Morse Kans	Post Surgeon Newport Barracks Newport Ky	Miss Mattie Laws Port Eads La	Harvard College Observat'y Cambridge Mass
Agent U P R R Buffalo Park Kans	J L Steel Minneapolis Kans	Oscar Haynes Pellville Ky	E Dechamps Jr Shell Beach La	E C Brooks (Cambridge) Mt Auburn Mass
C S Culver Bucklin Kans	A C Abbott Marmaton Kans	Wm Martindell Princeton Ky	Maj S T Grisamore Thibodeaux La	Prof W M Davis Cambridge Mass
J M Lobaugh Coldwater Kans	J H Starke Macksville Kans	Prof O H Kennedy Richmond Ky	T A Williams West End La	F H Norton Chicopee Mass
J W Young Columbus Kans	Agent U P R R Monument Kans	H W Prissler Shelbyville Ky	Dr W M Guice Winnsborough La	G W Weeks Clinton Mass
H A Williams Concordia Kans	Agent U P R R McAllaster Kans	Louisiana.	Maine.	F A Tower Concord Mass
A G Alrich Cawker City Kans	Ed F Haberlein McPherson Kans	Dr C J Edwards Abbeville La	Post Surgeon Kennebec Arsenal Augusta Me	Gen J H Reid Cotuit Mass
E Shaw Cunningham Kans	Dr E M Turner Norton Kans	Prof H A Morgan Baton Rouge La	Jos Wood Bar Harbor Me	Jas Childs Deerfield Mass
Agent U P R R Collyer Kans	Agent U P R R Ogallah Kans	Dr L D Chauff Bonnet Carre La	L H Murch Belfast Me.	Conant Observatory Dudley Mass
J W Young Columbus Kans	Agent U P R R Oakley Kans	W W Wall Cheneyville La	Dr D E Seymour Calais Me	C V S Remington Fall River Mass
J B Handy Downs Kans	D Doyle Oswego Kans	J A White Jr Clinton La	Silas West Cornish Me	O B Truesdell Fiskdale Mass
William Taylor Dwight Kans.	Miss Maud Adams Page Kans	L M Howard Coushatta La	H M Mansfield Fairfield Me	Dr J Fisher Fitchburg Mass
C W Gilmore Elco Kans	W J Jackson Quenemo Kans	A B Goodrich Crowley La	J M S Hunter Farmington Me	Dr A P Mason Fitchburg Mass
Dr A C Williams Elk Falls Kans	Agent U P R R Quinter Kans	Hon S P Henry Cameron La	Prof W C Strong Kent's Hill Me	Boston Water Works Framingham Mass
Prof T H Dinsmore Jr Emporia Kans	D M Adams Rome Kans	Dr W V Taylor Davis La	Union Water Power Co Lewiston Me	Dr W U Brown Gilbertville Mass
C D Perry Englewood Kans	A P Collins Salina Kans	W P Moore Delhi La	V P Hall Mayfield Me	C Woolley Groton Mass
Agent U P R R Ellis Kans	J W Goodell Sedan Kans	L D Martin Edgard La	G L Upton Millridge Me	J S Francis Groton Mass
Ed Atkin Fremont Kans	Dr S S Kaysbier Seneca Kans	W P Chandler Farmerville La	Prof M C Fernald Orono Me	B B Cutler Heath Mass
Post Surgeon Fort Leavenworth Kans	S P Kane Scott City Kans	Prof G Williamson Grand Cane La	Post Surgeon Fort Preble Portland Me	Essex Company Lawrence Mass
Post Surgeon Fort Riley Kans	W H Harvey Shields Kans	J R Brown Girard La	C Hopkins West Jonesport Me	Leicester Academy Leicester Mass
Post Surgeon Military Prison Fort Leavenworth Kans	Agent U P R R Sharon Springs Kans	Rev J P Moore S J Grand Coteau La	Maryland.	W B Hosmer Leominster Mass
Jesse Royer Gove Kans	C E Wightman Tribune Kans	A F Chanfrau Houma La	Post Surgeon Fort McHenry Baltimore Md	Prop Locks & Canals Lowell Mass
Agent U P R R Grinnell Kans	Prof J T Lovewell Topeka Kans	D N Harris Homer La	A E Acworth Barren Creek Springs Md	F E Saunders Lowell Mass
Agent U P R R Grainfield Kans	Sgt T B Jennings Topeka Kans	W A Reed Hammond La	E T Shriver Cumberland Md	M W Graves Ludlow Mass
R M Lawyer Grenola Kans	J W Tipton Toronto Kans	G W Whitworth Jeanerette La	H Shriver Cumberland Md	J Haviland Ludlow Mass
Wm Featherstone Globe Kans	W P Cochran Wakefield Kans	Hugh Watson Jonesville La	Prof G G Curtis Fallston Md	J C Haskell Lynn Mass
L W Dennen Havensville Kans	Agent U P R R Wa Keeney Kans	Prof W C Stubbs Sugar Ex Station Kenner La	McClintock Young Frederick Md	W C Winter Mansfield Mass
D C Ruth Halstead Kans	J H Wolfe Wellington Kans	J J Davidson La Fayette La	J T De Sellum Gaithersburg Md	R M Gow Medford Mass
				Middleborough Water Wk's Middleborough Mass

Dr G E Fuller Monson Mass	F A Zerby Berrien Springs Mich	W A Black Kalamazoo Mich	Minnesota.	W H Hill Palo Alto Miss
Wm Street Mount Nonotuck Mass	Dr H V Tutton Benton Harbor Mich	Dr H B Baker Sec State Board of Health Lansing Mich	John Ross Crookston Minn	Dr C W Bolton Pontotoc Miss
Dr W D Hodges Nahant Mass	D B Alger Birch Run Mich	Sgt N B Conger Lansing Mich	D F Akin Farmington Minn	Dr J A Mead Pearlington Miss
T R Rodman New Bedford Mass	S Alexander Birmingham Mich	A Lathrop Lathrop Mich	Dr C F Dight Faribault Minn	O A Carson Port Gibson Miss
New Bedford Water Works New Bedford Mass	H D Burrell Bangor Mich	G A Whitbeck Montague Mich	A Nuderer (Leach Lake) Grand Rapids Minn	Dr J W Stevens Rienzi Miss
F V Pike Newburyport Mass	D Woodward Clinton Mich	J Randall Mio Mich	L B Davis Le Sueur Minn	Dan McCall (Ship Island) Biloxi Miss
Newburyport Water Works Newburyport Mass	E S Grierson Calumet Mich	H C Bradish (Madison) Adrian Mich	D R Stockey Mankato Minn	J N Teunisson Summit Miss
J M Clark Northampton Mass	H J Webb Casaopolis Mich	N Cody Mayville Mich	C E Crane Medford Minn	Prof R B Fulton University Miss
C H Kohlrausch Jr North Billerica Mass	Jacob Walton Cheboygan Mich	Post Surgeon Fort Mackinac	Wm Cheney Minneapolis Minn	A J Sanderson Vaiden Miss
Miss L B Knapp Plymouth Mass	J H Van Riper Chelsea Mich	Jas White (Caldwell) Manton Mich	D T Wheaton Morris Minn	A Erikson Water Valley Miss
Mrs Ellen M West Princeton Mass	M Shotwell Concord Mich	Dr G H Green Marshall Mich	L G Moyer Montevideo Minn	W S Davis Waynesborough Miss
J R Smith Provincetown Mass	G W Teller Colon Mich	J A Hartzler Mottville Mich	G H Alden Northfield Minn	Prof J Reeves Washington Miss
Miss L W Chase Royalston Mass	W C Brown Crystal Falls Mich	E E Bushnell Noble Mich	Neil Johnson (Pine River) Brainerd Minn	W S Coleman West Point Miss
Mrs I D Page Randolph Mass	E H Green Charlevoix Mich	N Wilson North Aurelius Mich	B C Finnegan (Pokegama Falls) Grand Rapids Minn	H C Goosey Yazoo City Miss
Elisha Slade Somerset Mass	Post Surgeon Fort Wayne Detroit Mich	P Mayo (North Marshall) Battle Creek Mich	Prof O Whitman Red Wing Minn	Missouri.
A A Smith Salem Mass	H E Terry East Saginaw Mich	H E Gill Northport Mich	Capt F Wherland (Rolling Green) Fairmont Minn	Dr H W Tuttle Adrian Mo
H W Cushing South Hingham Mass	J W Chapin Eden Mich	C H Buel Olivet Mich	H W Hill St Charles Minn	L T Theilmann Appleton City Mo
Post Surgeon National Armory Springfield Mass	Mrs H A Hepburn Evart Mich	W H Faxon Ovid Mich	Cpl John Healy Saint Paul Minn	D H Webster Austin Mo
Dr E U Jones Taunton Mass	L D Watkins Fairview Mich	C H Prentiss Otsego Mich	L Curry Sheldon Minn	Newburn & Co Bethany Mo
A F Sprague Taunton Mass	M Conklin Fitchburgh Mich	L Marvill Parkville Mich	Post Surgeon Fort Snelling Minn	J H Lawrence Bradleyville Mo
Taunton Water Works Taunton Mass	C I Rathbun Fremont Mich	H M Warren Pontiac Mich	Mississippi.	L Benecke Brunswick Mo
J S Newcomb Westborough Mass	W L Fisher Flint Mich	J W Hutchins Pulaski Mich	Prof J M White Agricultural College Miss	R L Roache California Mo
J B Hall Worcester Mass	J W Morris Grape Mich	J C Gould Paw Paw Mich	John Osoinach Bay St Louis Miss	W D Vandiver Cape Girardeau Mo
Dr S W Abbott Wakefield Mass	F W Ball Grand Rapids Mich	L R Brown Rawsonville Mich	E W Bee Brookhaven Miss	Pettit & Welch Carrollton Mo
Boston Mfg Co Waltham Mass	O Palmer Grayling Mich	H M Heal Roscommon Mich	J M Cox Batesville Miss	G E Harris Cassville Mo
Prof Sarah F Whiting Wellesley Mass	J H Scott Gaylord Mich	Prof O D Thompson Romeo Mich	A G Smith Booneville Miss	Dwight C Hanna Carthage Mo
G S Newcomb Westborough Mass	Prof F C Smith Gladwin Mich	O A Hunt St John's Mich	W B Hopkins Columbus Miss	Dr M McKenzie Centerville Mo
L R Symmes Winchester Mass	A Beebe Gulliver Mich	W E Nims Sand Beach Mich	G W Smith-Vaniz Canton Miss	Levi Chubbuck Columbia Mo
Michigan.	F W Munson Howell Mich	Rev J Ferris St Ignace Mich	J C Bradley Corinth Miss	Sgt A L McRae Columbia Mo
G W Grigsby Allegan Mich	E B Rodgers Hillsdale Mich	J J Decker Standish Mich	C W Barber Edwards Miss	Rev Fr Paul Conception Mo
P M Smith Alma Mich	L B Smith Hanover Mich	C H Force Stockbridge Mich	James E Mills Enterprise Miss	Henry Miller Concordia Mo
W H Howard Adrian Mich	E S Shaw Harbor Springs Mich	R C Gardner Stanton Mich	I N Bedford Fayette Miss	Wick Morgan Dadeville Mo
H Obenhoff Atlantic Mine Mich	F H Edwards Hart Mich	Post Surgeon Ft Brady Sault de Ste Marie Mich	E R Somerville Greenville Miss	S Newton Eldon Mo
Prof C E Barr Albion Mich	Dr W W Mitchell Harrisville Mich	Dr J S Caulkins Thornville Mich	J H Cleveland Hattiesburgh Miss	A Reinisch Excelsior Springs Mo
Wm Atkin (Arbela) Millington Mich	Dr F R Timmerman Hastings Mich	M M McCormack Vienna Mich	Dr F B Shuford Holly Springs Miss	Prof T Berry Smith Fayette Mo
A L Colton Ann Arbor Mich	T N Clark Harrison Mich	A Smith Vandalia Mich	H T Bryant Holly Springs Miss	Fred W Duenckel Forest Park Sig Station Saint Louis Mo
F N Hilton (Ball Mt) Pontiac Mich	A D DeGarmo Highland Station Mich	W A Weeks West Branch Mich	S Flanigan Jackson Miss	Sam M Ruley Fortesque Mo
R O Gould (Berlin) Berville Mich	C F Leipprandt Hayes Mich	J H Foster Williamston Mich	L Heyman Kosciusko Miss	Wm Muir Fox Creek Mo
Mrs Ida McDiarmid Bear Lake Mich	J B Thorburn Holt Mich	J J Gelding Weldon Creek Mich	W B Windsor Lake Miss	Prof C W Pritchett Glasgow Mo
David Strahly (Bronson) Burr Oak Mich	R M Watkins Ionia Mich	V W Eaton (Washington) Romeo Mich	Capt C D Koch (Logtown) Pearlington Miss	Miss Maud Rippey Glenwood Mo
C W Cornwall Bell Branch Mich	O L Giddings Ivan Mich	J C Bemiss Ypsilanti Mich	B T Webster Louisville Miss	L M Bean Gordonville Mo
C Leavitt Bellaire Mich	J A Rath Jackson Mich	C S Woodward Ypsilanti Mich	P E Blumer Moss Point Miss	C L Hixson Hannibal Mo
W J Jones Berrien Springs Mich	W Bice Jeddo Mich		B J Allen Macon Miss	A J Sharp Harrisonville Mo
			S J Russell Okolona Miss	

List of voluntary observers of the Signal Service, etc.—Continued.

Chas Maushund
Hermann Mo
John C Halligan
Jefferson City Mo
S J Spurgeon
Kansas City Mo
Mrs J E Emerson
Kidder Mo
S S Stahl
Kidder Mo
Charles Patterson
Kirksville Mo
D W Hughes
Laddonia Mo
Ida L Joslin
Langdon Mo
Prof J K Hull
Lamar Mo
J S Slaven
La Monte Mo
M W Serl
Lebanon Mo
J R Eaton
Liberty Mo
E R Graham
(Marshall) Grand Pass Mo
W H Black
Marshall Mo
F King
Marshfield Mo
Robert Ruxton
Miami Mo
J F Llewellyn
Mexico Mo
Mrs M E Sydenstricker
New Frankford Mo
Max Eimbeck
New Haven Mo
Henry Bruhl
Oak Ridge Mo
Wm Kaucher
Oregon Mo
M B W Harman
Pickering Mo
W A McDowell
Platt River Mo
Silas C Turnbo
Protem Mo
Wm Hiron
Princeton Mo
C B Armstrong
Sarcxie Mo
Dr J R Mudd
St Charles Mo
L C Saeger
St Charles Mo
Post Surgeon
Jefferson Barracks
Saint Louis Mo
Prof F E Nipher
Washington University
Saint Louis Mo
C G Taylor
Sedalia Mo
J S Chandler
Shelbina Mo
E A Pinnell
Steelville Mo
Prof Geo L Osborne
Warrensburg Mo
Prof J H Frick
Warrenton Mo
Capt Wm Hughes
Willow Springs Mo
G W Goodlett
Windsor Mo
J R Dudley
Wither's Mill Mo
Montana.
R W Rock
(Henry's Lake Idaho)
Allerdice Mont
S M Corson
Choteau Mont
Post Surgeon
Fort Assiniboine Mont

Post Surgeon
Fort Custer Mont
Post Surgeon
Fort Keogh Mont
Post Surgeon
Fort Missoula Mont
Post Surgeon
(Camp Poplar River)
Poplar Creek Agency Mont
Wm Gaddis
Fort Logan Mont
Post Surgeon
Fort Shaw Mont
J H Ray
Glendive Mont
C A Wood
Horr Mont
R C Clendenin
Martinsdale Mont
Dr J E Jenkins
(Blackfeet Agency)
Piegan Mont
J M Graham
Powderville Mont
Eugene Stark
Virginia City Mont
C E Woodworth
Woodworth Mont
Nebraska.
Dr W R Lewis
Alliance Nebr
G Shedd
Ashland Nebr
Peter Fowlie
Ansley Nebr
A H Gale
Bassett Nebr
G Roberts
Creighton Nebr
Prof G D Swezey
Crete Nebr
C E Chadsey
Crete Nebr
Sgt G A Loveland
Crete Nebr
Mrs L A Wibley
Culbertson Nebr
Chas Seltz
De Soto Nebr
E B Taylor
David City Nebr
Dr I Humphrey
Fairbury Nebr
P B Gailford
Fairfield Nebr
Post Surgeon
Fort Niobrara Nebr
Post Surgeon
Fort Omaha Nebr
Post Surgeon
Fort Robinson Nebr
Post Surgeon
Fort Sidney Nebr
J N Bennett
Franklin Nebr
Isaac E Heaton
Fremont Nebr
W L Rutledge
Grant Nebr
J B Moore
Grand Island Nebr
G S Truman
Genoa Nebr
R B Spear
Geneva Nebr
John P Finley
Gering Nebr
O F Hartwell
Hastings Nebr
Wm Waterman
Hay Springs Nebr
Dr C M Easton
Hebron Nebr
M E Randolph
Holdrege Nebr
G D Carrington
Howe Nebr

J M Bird
Imperial Nebr
Mrs M G Erickson
Kennedy Nebr
D Henderson Jr
Kimball Nebr
University of Nebraska
Lincoln Nebr
J M Tipton
Lexington Nebr
John Ellis (Marquette)
Central City Nebr
J Hull
Minden Nebr
E W Black
North Loup Nebr
J B Parmalee
Nebraska City Nebr
G S Clingman
Oakdale Nebr
A N Morris
O'Neill Nebr
E H Talbot
Ough Nebr
C Shieldstream
Palmer Nebr
R P Harris
Paxton Nebr
E Smith
Ravenna Nebr
P W Kissner
Syracuse Nebr
J S Spooner
Sargent Nebr
W J Hoyford
Seward Nebr
W I Dunlap
Tecumseh Nebr
Dr A D Nesbit
Tekamah Nebr
J L Truman
West Hill Nebr
G Treat
Weeping Water Nebr
E G Bruner
West Point Nebr
J R Campbell
Weston Nebr
Mrs C W Le Bar
Wilcox Nebr
Nevada.
O B Vincent
Austin Nev
Agent C P R R
Beowawe Nev
G Nicholl
Belmont Nev
W H Shockley
Candelaria Nev
Prof C W Friend
Carson City Nev
Sgt D C Grunow
Carson City Nev
W T Crane
(Cranes' Ranch)
Elko Nev
D Fowler
Downeyville Nev
J F Cupid
Ely Nev
C H Sproule
Elko Nev
P W Davis
El Dorado Canyon Nev
W M Ley
Eureka Nev
G W Dungan
Genoa Nev
Agent C P R R
Halleck Nev
C F Mengel
Hawthorne Nev.
L Merrill
(Hot Springs)
White Plains Nev
Agent C P R R
Humboldt Nev

Miss Kate Lewers
(Lewers Rancho)
Leonard Creek Nev
S F Reeves
Mlil City Nev
N P Dooley
Pioche Nev
Agent C P R R
Palisade Nev
Wm Oothout
Palmetto Nev
I G McMonigal
Punch Bowl Nev
S A Jones
State Univers'y Reno Nev
James B Gilmore
Tybo Nev
C R Carter
Verdi Nev
Mark Averill
Virginia City Nev
H White (Younts Ranch
Nev) Ivanpah Cal
New Hampshire.
F W Palmer
Antrim N H
O F Cole
Berlin Falls N H
Q A Bridges
Berlin Mills N H
W L Foster
Concord N H
N A Briggs
East Canterbury N H
John M Wilson
Groveton N H
Ag'l Experiment Station
Hanover N H
Dartmouth College Obs'y
Hanover N H
Lake Winipiseogee
Cotton and Woollen M'fg Co
Lake Village N H
Charles Norse
Littleton N H
W Little
Manchester N H
Jackson Co
Nashua N H
C E Hosmer
North Sutton N H
W C Gale
Newton N H
J L Binford
North Conway N H
Miss Helen M Clark
Plymouth N H
N B Waters
Stratford N H
E A Knowlton
Walpole N H
A A Higgins
West Milan N H
New Jersey.
R Ross
Asbury N J
H Allaire
Allaire N J
Prof C F Richardson
Beverly N J
J H Preston (Billingsport)
Paulsborough N J
H A Jordan
Bridgeton N J
Rev W J Leggett
Belleville N J
Dr J F Leaming
Cape May C H N J
H Y Postma
Egg Harbor City N J
Miss A S Yard
Freehold N J
R N Cornish
Gillette N J
J M Dalrymple
Hopewell N J

Dr F C Price
Imlaytown N J
Geo. Fleming
Junction N J
Dr G H Larison
Lambertville N J
G W Hockenbury
Locktown N J
J H Eadie
Madison N J
T J Beans
Moorestown N J
W Earle Cass
Newark N J
F W Ricord
Newark N J
Mrs G H Cook
New Brunswick N J
C V Myers
New Brunswick N J
Prof A Scott
New Brunswick N J
Sgt E W McGann
New Brunswick N J
T W Iliff
Newton N J
W Lake
Ocean City N J
Rev S W Knipe
Oceanic N J
J Fleming
Readington N J
S Haines
Rancocas N J
Dr W J Chandler
South Orange N J
A D Atwood
Tenafly N J
E R Cook
Trenton N J
W T Wilson
Woodbury N J
New Mexico.
A Knell
Albert N Mex
H S Beattie
Albuquerque N Mex
W P Metcalf
Antelope Springs N Mex
S Paris
Bernalillo N Mex
E A Sutherland
Chama N Mex
J M Fish
Coolidge N Mex
B Ventura Martinez
Cuba N Mex
M G Burkholder
Embudo N Mex
E A Clemens
Estalida Sps (via)
Magdalena N Mex
Post Surgeon
Fort Bayard N Mex
Post Surgeon Fort Marcy
Santa Fe N Mex
Post Surgeon
Fort Stanton N Mex
Post Surgeon
Fort Union N Mex
Post Surgeon
Fort Wingate N Mex
J E Whitmore
Gallinas Spring N Mex
J E Smith
Hillsborough N Mex
Richard Pohl
Los Lunas N Mex
E K Caldwell
Monero N Mex
Jose M Vega
Nogal N Mex
Jno Boquet
Pojuaque N Mex
R H Hills (Red Canon)
Carthage N Mex

Wm L McClure Taos N Mex New York. H R Ainsworth M D Addison N Y F S Place Alfred Centre N Y J P Mills Amersand, N Y Richard B Arden (Ardenia) Garrison's N Y J D Tate Arcade N Y J J Eastman Binghamton N Y Dr F A Winne Brookport N Y D B Stillman Brookfield N Y Prof W C Peckham 406 Clason ave Brooklyn N Y Post Surgeon Fort Porter Buffalo N Y Prof H Priest Canton N Y Thomas Manning Carmel N Y R Sanford Miller Conestableville N Y G Pomeroy Keese Cooperstown N Y Post Surgeon Davids Island N Y D C Moon Dunkirk N Y Dr J Finley Bell East Hampton N Y Gerity Brothers Elmira N Y T P Yates (Factoryville) Waverly N Y Robert Warwick Fleming N Y Mrs N S Yates Geneva N Y Post Surgeon Fort Hamilton N Y T M Younglove Hammondsport N Y C H Spaulding Hess Road Station N Y James Hyatt (Honeymead-brook) Stanfordville N Y Chas E Whitney Humphrey N Y C P Bouton Hyndsville N Y G A Trowbridge Ilion N Y Mrs Jane Pulver Italy Hill N Y Engineering Dept Cornell University Ithaca N Y Prof E A Fuertes Ithaca N Y Observer Signal Service Ithaca N Y Henry A Stone (Kingston) Rondout N Y J H Bailey Keene Valley N Y Wm L Annin Le Roy N Y W Hudson Stephens Lowville N Y Edward Hall C E Lyon Mountain N Y Dr M A Veeder P O Box 602 Lyons N Y M H Kinsey Massena N Y F X Straub Middleburgh N Y	R S Holmes (Marshland) Apalachin N Y Albert H Johnson Malone N Y S Talcott Middletown N Y Edward A Smiley Minnewaska N Y J E White Mt Morris N Y Director Met'l Observatory Central Park New York City Post Surgeon Fort Columbus New York City G A Yates New Lisbon N Y C A Wooster North Hammond N Y Chas Fenton Number Four N Y N Nelson Ogdensburg N Y J P Davis Oxford N Y G H Hudson Plattsburgh N Y E B Bartlett (Palermo) Vermillion N Y L D Cummings Palmyra N Y Wm D Lovell Pendleton Centre N Y Prof John M Dolph Port Jervis N Y W H Jeffers (near Perry City) Trumansburgh N Y Post Surgeon Plattsburgh Barracks N Y Peter Vilas Potsdam N Y Vassar College Obs'y Poughkeepsie N Y J N Tilden Peekskill N Y Wm Weaver Quaker Street N Y Dr H C Sutton Rome N Y Post Surgeon Madison Barracks Sackett's Harbor N Y Selah B Strong Setauket N Y Rev Charles Simpson Sherman N Y James E Wilson South Canisteo N Y D C Sharpe South Kortright N Y Post Surgeon Ft Wadsworth Rosebank Staten Island N Y R T Church Turin N Y Thomas Birt Utica N Y George A Fairbanks Watertown N Y Rev Dwight W Smith Watkins N Y Post Surgeon Willets Point Whitestone N Y Post Surgeon Military Academy West Point N Y Post Surgeon Fort Schuyler West Chester N Y Post Surgeon Watervliet Arsenal West Troy N Y O F Corwin Wedgwood N Y	Prof O R Willis White Plains N Y Post Surgeon Fort Niagara Youngstown N Y North Carolina. Dr Karl von Ruck Asheville N C H C Dunn Clear Creek N C Prof J W Gore Chapel Hill N C T B Lindsley Douglas N C L Crawford Franklin N C Prof Richard H Lewis Hendersonville N C Dr W B Berry Hot Springs N C Dr T G Harbison Highlands N C Dr R L Beall Lenoir N C Henry Tiffany Marion N C Dr P L Murphy (Insane Asy) Morganton N C Prof H L T Ludwig Mt Pleasant N C J W Ashby Mt Airy N C W G Boyd New Berne N C Geo S Willis Oak Ridge N C Prof A McIver Pittsborough N C T C Harris Raleigh N C Dr Herbert B Battle Raleigh N C Sgt C F von Herrmann Raleigh N C J A Hedrick Salisbury N C R J Noble Smithfield N C H L Kimrey Soapstone Mount N C T A Clark Weldon N C Dr J M Gallagher Washington N C H Clay Williams Wilmington N C North Dakota. Albert T Cole Ellendale N Dak Post Surgeon Fort A Lincoln N Dak Post Surgeon Fort Buford N Dak Post Surgeon Fort Pembina N Dak Post Surgeon Fort Totten N Dak Post Surgeon Fort Yates N Dak G S Sprague (University) Grand Forks N Dak L C Stanford Kelso N Dak Julius H Hoof Napoleon N Dak L M P Griswold New England City N Dak F R Hill Steele N Dak C A McKene Wahpeton N Dak Peter Ross Wild Rice N Dak Ohio. Dr P H Clark Ashland Ohio	Prof A D Morrell Athens Ohio H V Egbert Akron Ohio Frank E Fitch Belleville Ohio P W Barton Bement Ohio S M Painter Bangorville Ohio E T M Williams Clarksville Ohio Post Surgeon Columbus Barracks Columbus Ohio Prof B F Thomas Columbus Ohio Sgt C M Strong Columbus Ohio G A Hyde 85 Kennard st Cleveland Ohio Prof W F McDaniel Celina Ohio H Renick Circleville Ohio C F Stokey Canton Ohio W H Baker Ohio State University Columbus Ohio B B Ault Demos Ohio Mrs Edith E L Boyer Dayton Ohio C W Goodspeed Elyria Ohio A C Beardsley Ellsworth Ohio Prof A C Redding Findlay Ohio G M Fink Fostoria Ohio S M Luther Garrettsville Ohio C G Katzenberger Greenville Ohio Dr T W Gordon Georgetown Ohio W B Longstreth Gratiot Ohio D G Lewis Hassan Ohio James Bull Hanging Rock Ohio Prof G H Colton Hiram Ohio Prof N B Hobart Hudson Ohio Dr J B Owsley Jacksonborough Ohio J L Hervey Jefferson Ohio L J Demarest Kenton Ohio J D Hadermann Leipsic Ohio Dr James Little Logan Ohio W S Dean Lordstown Ohio Prof T D Briscoe Marietta Ohio E H Raffensberger Marion Ohio C H Morris McConnelsville Ohio Dr T C Hunter Napoleon Ohio Dr A M Beers New Comerstown Ohio Jos A Hook New Alexandria Ohio H D Govey North Lewisburgh Ohio E U Hyde Orangeville Ohio	Prof F F Jewett Oberlin Ohio Edson A Lowe Ottawa Ohio Dr D B Cotton Portsmouth Ohio Dr D N Allard Pomeroy Ohio George Olinger Springborough Ohio Peter Bowman Shiloh Ohio Prof T H Sonedecker Tiffin Ohio Dr A Billhardt Upper Sandusky Ohio M D McCorkle Vienna Ohio Prof C W Williamson Wapakoneta Ohio E B Michener Waynesville Ohio Dr O N Stoddard Wooster Ohio Thomas Mikesell Wauseon Ohio Prof J Haywood Westerville Ohio Dr F Young Weymouth Ohio D Lorbach Waverly Ohio L S Motte West Milton Ohio Mrs E P Wheeler Wheeler Ohio Prof W J Hancock Yellow Springs Ohio A G Frost Youngstown Ohio Oklahoma. Post Surgeon Fort Reno Okla Post Surgeon Fort Sill Okla Morris Collar Guthrie Okla Oregon. John Briggs Albany Oregon F L Carter Ashland Oregon Geo Bennett Bandon Oregon T L Arnold Beulah Oregon State Agr'l College Corvallis Oregon U S Engineer Officer Cascade Locks Oregon E P Balch Dufur Oregon Thos Pearce Eola Oregon Dr G Wigg East Portland Oregon Prof G W Shaw Forest Grove Oregon J S Gray Gardiner Oregon F S Moore Gold Beach Oregon J H Neal (Happy Valley) Diamond, Oregon A Smith Heppner Oregon W H Goudy Hubbard Oregon Dr P G Barrett Hood River Oregon P Britt Jacksonville Oregon J D McCully Joseph Oregon S C Beach Lake View Oregon
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W H Colwell Lone Rock Oregon	S C Schumacker Indiana Pa	A W Batterly Wilkes Barre Pa	Prof Louis McLouth Brookings S Dak	W C Hall Jacksboro Tenn
J K Romig La Grande Oregon	E C Lorentz Johnstown Pa	Dr J C Green West Chester Pa	Wm M Cappett Canton S Dak	H M Young Kingston Tenn
Rev Dr Urban Fisher S J Mount Angel Oregon	B P Kirk Kennett Square Pa	H D Deming Wellsborough Pa	W H Boals Clark S Dak	W J Inman Kingston Springs Tenn
Capt W Harris McMinnville Oregon	R J Mickey Kilmer Pa	Chas Beecher Wysox Pa	Thomas H Ruth De Smet S Dak	J H Burrow Lynnville Tenn
G Venable North Powder Oregon	F O Whitman Lewisburgh Pa	Prof W F Wickersham Westtown Pa	F J Cross (Cross) Etta Mine S Dak	A B Ewing Lewisburgh Tenn
Hon H E Hayes Oswego Oregon	H L Shull Lansdale Pa	W C Kimber Waynesburgh Pa	Post Surgeon Fort Bennett S Dak	Dr W A Dietrich Lookout Mt Tenn
Sgt B S Pague Portland Oregon	E E Weller Lancaster Pa	Mrs L H Grenewald York Pa	Post Surgeon Fort Meade S Dak	C Hawkins McKenzie Tenn
P Zahnes Pendleton Oregon	D M Shelley (Aqueduct) Logania Pa	Rhode Island.	Post Surgeon (Fort Randall) Armour S Dak	Dr J D Plunket Nashville Tenn
W C Cusick Telocaset Oregon	Prof J A Robb Lock Haven Pa	N G Herreshoff Bristol R I	Post Surgeon Fort Sully S Dak	Sgt H C Bate Nashville Tenn
S L Brooks The Dalles Oregon	Geo W T Warburton Le Roy Pa	N Helme Kingston R I	G A Perly Flandreau S Dak	W C Thompson Nunnely Tenn
A W Severance Tillamook Oregon	J & B H Metcalf Meadville, Pa	C O Flagg Kingston R I	W W Butler Highmore S Dak	J C Williamson Parksville Tenn
Dr H W Vincent Toledo Oregon	J J Boyd Mauch Chunk Pa	G W Pratt Lonsdale R I	W J Harding Howard S Dak	Dr W F G Wilson Rugby Tenn
G W Dalles Vernonia Oregon	Thos F Sloan McConnellsburgh Pa	Post Surgeon Fort Adams Newport R I	Sgt S W Glenn Huron S Dak	F K Fergusson Riddletown Tenn
Pennsylvania.	Stephen S Jenkins Meshoppen Pa	Thos Dunn Newport R I	A S Stuver Kimball S Dak	Miss C M Nugent Rogersville Tenn
Dr C B Dudley Altoona Pa	W H Kline Myerstown Pa	C H Cannon Olneyville R I	D W Diggs Milbank S Dak	H R Hinkle Savannah Tenn
J Grathwohl Blooming Grove Pa	W T Butz New Castle Pa	J H Walker Pawtucket R I	O B Chesley Oelrichs S Dak	W J Breeding Spring Dale Tenn
Lerch & Rice Bethlehem Pa	J S Gibson Nisbet Pa	Office City Engineer Providence R I	Mrs M F Goddard Onida S Dak	B P Fagan Sharp Tenn
A H Boyle Blue Knob Pa	Dr Geo M Grim Ottsville Pa	D W Hoyt Providence R I	J S Headley Parkston S Dak	A S Curry Trenton Tenn
M H Boye Coopersburgh Pa	J D Brennan Pleasant Mount Pa	South Carolina.	J A Parker Scranton S Dak	Miss Nora Williams Union City Tenn
J E Pague Carlisle Pa	Chas Moore Pottstown Pa	P W Scott Brewer Mine S C	E S Carter Sioux Falls S Dak	W E Watkins Watkins Tenn
Prof C M Thomas Clarion Pa	Post Surgeon Allegheny Arsenal	W G Peterson (Belmont) Newberry S C	J H Warren Spearfish S Dak	Dr C Buchanan Waynesborough Tenn
R M Graham Catawissa Pa	Pittsburgh Pa	W R Godfrey Cheraw S C	S C Butterfield St Lawrence S Dak	Texas.
Miss Mary A Ricker Chambersburg Pa	Frank Costin Petersburgh Pa	Hon A P Butler Columbia S C	Prof A W Thurston Vermillion S Dak	Oscar Samostz Austin Tex
Miss E A G Apple Charlesville Pa	John E Codman Bureau of Water	Observer Signal Service Columbia S C	G W Frink Wolsey S Dak	Dr Q C Smith Austin Tex
Wm Loveland Corry Pa	Philadelphia Pa	M P Daggett Conway S C	Tennessee.	G F Townsend Austin Tex
W T Gordon Coatesville Pa	W R Wallace Drexel Building	J W Earl (Evergreen) Holland's Store S C	A T B Etheridge Arlington Tenn	K D Blankinship Berlin Tex
A L Runyon Cannonsburgh Pa	Philadelphia Pa	P H Walsh Florence S C	J K P Wallace Andersonville Tenn	J G Sloan Brenham Tex
H D Miller Drifton Pa	Sgt T F Townsend Philadelphia Pa	Sarah A Crittendon Greenville S C	Rev C F Williams Ashwood Tenn	W H Potter (Bear Creek) Brady Tex
Theo Day Dyberry Pa	Franklin Institute Philadelphia Pa	W J Evans Hardeeville S C	F S Luther Hospital for Insane	H Stevens Brazoria Tex
T H Walton Doylestown Pa	Knowles Croskey Phoenixville, Pa	C B Webb Jacksonborough S C	Bolivar Tenn	Prof C S Newhall Brownwood Tex
C F Sweet Edinborough Pa	R C Stover Point Pleasant Pa	Colin Macrae (Kirkwood) Camden S C	G W Martin (Missionary Ridge)	W G Minor Coldwater Tex
T B Lloyd Emporium Pa	J L Heacock Quakertown Pa	McCully & Fretwell McCormick S C	822 Cherry Street Chattanooga Tenn	F R Blount Colorado Tex
E S Chase Eagle's Mere Pa	Rev W W Deatrich Rimersburgh Pa	H D Elliott Port Royal S C	J I Hall Covington Tenn	W M Spitler Burnett Tex
Dr J W Moore Easton Pa	Geo Lowder (Smith's Corners)	Miss N L Dawson Simpsonville S C	A A Arthur Cumberland Gap Tenn	J S Rogers Columbia Tex
G W Wood Frederick Pa	Point Pleasant Pa	J F Bayerly Spartanburg S C	Prof J A Lyons Clarksville Tenn	Prof Duncan Adriaance College Station Tex
J C Hilsman (Forks of Neshaminy)	Armstrong & Brownell Smithport Pa	J T Gray Spartanburg S C	Dr A Slack Cog Hill Tenn	W H Hamilton Box 169 Corsicana Tex
Prof S H Miller Greenville Pa	W M Schrock Somerset Pa	Dr W W Anderson Statesburgh S C	Miss Belle Baker Dare Tenn	E L Gibson Corsicana Tex
E C Wagner Girardville Pa	J M Boyer Selin's Grove Pa	E Gillard Trial S C	J F Pickett Dyersburgh Tenn	G H Chipman Childress Tex
N Moore Grampian Hills Pa	Prof Susan J Cunningham Swarthmore Pa	J Pagan Winnsborough S C	C F Vanderford Florence Station Tenn	F R Gillette Dallas Tex
T B Orchard (Salem Cor) Hamlington Pa	Prof Wm Frear State College Pa	H G Reid Walhalla S C	J C Diemer Fayetteville Tenn	Anthony Blum Durham Tex
Prof W J Swigart Huntingdon Pa	B M Hall South Eaton Pa	J R Schorb Yorkville S C	Dr John A Campbell Franklin Tenn	J C Edgar Duval Tex
Prof J A Stewart Holidaysburgh Pa	J A Roth Seisholtzville Pa	South Dakota.	W H Brown Greenville Tenn	H Graves Epworth Tex
John Torrey Honesdale Pa	Rev M Gustin Troy Pa	A H Olevin Aberdeen S Dak	J B Irwin Grand Junction Tenn	J N Morris Forestburgh Tex
	Wm Hunt Uniontown Pa	W S Hill Alexandria S Dak	R Downey Hohenwald Tenn	A Striegler Fredericksburgh Tex

Jas G Mallette Ft Worth Tex Post Surgeon Ft Bliss El Paso Tex Post Surgeon Ft Brown Brownsville Tex Post Surgeon Ft Clark Brackettville Tex Post Surgeon Fort Davis Tex Post Surgeon Del Rio Tex Post Surgeon Ft Eagle Pass Tex Post Surgeon Ft Hancock Tex Post Surgeon Ft McIntosh Laredo Tex Post Surgeon Camp Pena Colorado Marathon Tex Post Surgeon Ft Ringgold Rio Grande City Tex Post Surgeon San Antonio Tex Lum Woodruff Gallinas Tex D D Bryan Galveston Tex Sgt I M Cline Galveston Tex A B Gant Graham Tex W J Crowley Grapevine Tex Chas W Croft Hansford Tex C F Conklin Hartley Tex W A Snell Hearne Tex D R Sanders Houston Tex W T Barr Huntsville Tex Hugo Lehman La Grange Tex Dr C M Ramsdell Lampasas Tex G W Krech Longview Tex J E Fisher Luling Tex S G Lackey Mesquite Tex J L Vaughan Merkel Tex Louis Runge Menardville Tex Dr J C Riley Mountain Spring Tex Capt Julius Geisecke New Braunfels Tex C Runge New Ulm Tex Miss Carrie Roberts Panhandle Tex E H Snider Panter Tex W Weiss Round Rock Tex Postmaster Sierra Blanca Tex C M Tilford (Silver Falls) Mt Blanco Tex	W B Cormack Tyler Tex Charles T Mercer Venus Tex W H Godber Waco Tex Dr O Eastland Wichita Falls Tex Utah. Miss Hattie E Farnsworth Beaver Utah Post Surgeon Fort Du Chesne Utah B F Cooke Grouse Creek Utah William Brown Levan Utah E Caffall Losee Utah R Moncur Mt Carmel Utah H C Davidson Mt Pleasant Utah H Crouse Moab Utah W R May Nephi Utah W W Crossman Ogden Utah Miss Mary Ferguson Park City Utah Alex Matheson Parowan Utah N Anderson Richfield Utah Seth A Pymm St George Utah Post Surgeon Fort Douglas Salt Lake City Utah J Robbins Snowville Utah Vermont. W H Childs Brattleboro Vt H B Chamberlain Brattleboro Vt W B Gates 55 Elwood Avenue Burlington Vt H L Bixby Chelsea Vt C H Lane Cornwall Vt H B Lovering East Berkshire Vt Rev A Hazen Hartland Vt J W Hatch Jacksonville Vt Dr H A Cutting Lunenburg Vt Maj W T Paine Saxton's River Vt H F J Scribner Strafford Vt A Whitehead Vernon Vt B H Albee Weathersfield Vt Virginia. W N Stone Bedford City Va C R Moore Birdsnest Va	G F Eakle Bolar Va George Williams Casanova Va J A Thompson (Yancey's Mill) Crozet Va D A Heatwole Dale Enterprise Va D K Witte Fall Creek Depot Va Post Surgeon Fort Monroe Va Post Surgeon Fort Myer Va Washington D C Prof H D Campbell Lexington Va A T Lincoln Marion Va R V Gaines Mossing Ford Va G Dunn Nottoway Va Prof J M Colson Jr Petersburgh Va W H Pleasants Richmond Va Prof S C Wells Salem Va W N Parrott Stanardsville Va W C Hedrick Staunton Va J R Sim Summit Va H G Wadley Wytheville Va Washington. R M Hoskinson (Madrone P O) Blakeley Wash W H Mossman Chehalis Wash R C Willis Doe Bay Wash S R S Gray East Sound Wash Adolphus Voegeli Fairhaven Wash D Pullen Lapush Wash R W Starr Waterville Wash Post Surgeon Fort Canby Wash care Astoria Oregon Dr A Wilgus Fort Simcoe Wash Post Surgeon Fort Spokane Miles Wash Post Surgeon Fort Townsend Fort Townsend Wash H S Channing Seattle Wash C P Culver Tacoma Wash Post Surgeon Vancouver Barracks Wash Mrs C B Carpenter Vashon Wash Post Surgeon Fort Walla Walla Wash	West Virginia. Henry Resseger Ella W Va S L Zinn Gladesville W Va L F Miars (Mt Alto) Hartmonsville W Va J E Murdock Kingwood W Va D Titchenell Pleasant Hill W Va F M Swann Tyler's Creek W Va G H Trembly Tannery W Va Wisconsin. Prof C A Bacon Beloit Wis H Besse jr Butternut Wis B C Curtis Cadiz Wis W R Collie Delavan Wis Joseph G Lawton De Pere Wis J E Breed Embarrass Wis Prof I M Mitchell Fond du Lac Wis H M Crombie Glasgow Wis Dr M L Robey Grantsburgh Wis H J Thomas Greenwood Wis Horatio Flagg Hayward Wis J A McIntosh Honey Creek Wis A L Hatch Ithaca Wis A J Looze Lincoln Wis Washburn Observatory Madison Wis Miss Johanna Lups Manitowoc Wis Dr F Robert Zeit Medford Wis Wm Heaslett Neillsville Wis Prof G M Browne Oshkosh Wis E M Corey Peshtigo Wis Miss Kate Barnsdale Plover Wis J Sutter Portage Wis E S Koepenick Koepenick Wis C Rice Wauzeka Wis U H Anderson Weston Wis Wyoming. Wm Werner Fort Fetterman Wyo Dr L S Barnes Laramie Wyo F S Lusk Lusk Wyo J F Crawford Saratoga Wyo	M R Johnston Wheatland Wyo Post Surgeon Fort Russell Wyo Post Surgeon Fort McKinney Wyo Post Surgeon Camp Pilot Butte Rock Springs Wyo Post Surgeon Fort Sheridan Mammoth Hot Springs Wyo Post Surgeon Fort Washakie Wyo Foreign. Prof J Bolam Govt Naviga School 14 Dock Place Leith Scotland Dr C F Hering Burnside (Coronie) Colony of Surinam Dutch Guiana S A G J Gibbs Grand Turk Turks Islands Brit W I Director Meteorological Obs'y Guanajuato Mexico Gen Russell Hastings Hamilton Bermuda Prof M Leal Leon Guanajuato Mexico Director Astro and Met'l Obs'y Mazatlan Mexico Director Cen Met Obs'y City of Mexico Mexico George Matson Topolobampo Sinaloa Mexico Prof C H McLeod McGill College Obs'y Montreal Canada Capt Adolphus Peele New Westminster British Columbia Prof P Scherer Meteorological Obs'y Port au Prince Hayti Director Catholic Institute Pueblo Mexico Director Institute de Ciencias del Estado de Zacatecas Mexico J Byrns La Logia Sinaloa Mexico J Higgins Saint Johns Newfoundland Curtis J Lyons Honolulu Hawaiian Islands Rafael Junquera Santiago de Cuba G Murdock St Johns New Brunswick Dr Enrique del Monte Office of Astro & Met Havana Cuba Jos Ridgeway St Thomas Dutch W I
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List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, during the three months ending December 31, 1890.

Name of vessel.	Captain.	Name of vessel.	Captain.	Name of vessel.	Captain.
Am. s. s. Adirondack.....	J. W. Sansom.	Belg. s. s. De Ruyter.....	J. J. Brevens.	Fr. s. s. La Normandie.....	G. Collier.
Br. Adriatic.....	E. J. Smith.	Br. Devonia.....	Jno. Craig.	Span. Leonora.....	J. de Alegria.
Nor. Agnes.....	F. Hansen.	Br. Dorian.....	J. McFarlin.	Ger. Leipzig.....	D. Kohlenbeck.
Br. Aguan.....	J. Adair.	Ger. Dresden.....	W. Krukoffer.	Br. Lepanto.....	H. S. S. Wise.
Alisa.....	J. W. Morris.	Br. Dunmore.....	A. J. Campbell.	It. Letimbro.....	M. Di Mario.
Alameda.....	H. G. Morse.	Fr. Dunmore Head.....	J. Auld.	Fr. Lisnacieve.....	Fred. R. Evans.
Alaska.....	G. S. Murray.	Br. Dupuy de Lome.....	S. Dechaille.	Llandaff City.....	W. Pitt.
Albany.....	H. A. Gough.	Br. Durham City.....	J. A. Jacobsen.	Lochmore.....	R. E. Jepson.
Alene.....	E. J. Seiders.	Br. Earnwell.....	H. W. Jamison.	Lord Clive.....	P. Urohart.
Alexander Elder.....	R. Boucher.	Br. Edam.....	A. Potjer.	Lord Gough.....	E. M. Hughes.
Algiers.....	F. W. Mason.	Br. Egyptian Monarch.....	T. M. Irvin.	Lord O'Neil.....	James Davis.
Algonquin.....	J. McKee.	Ger. Elbe.....	H. Baur.	Lowlands.....	B. Blacklin.
Nor. Alfred Dumois.....	L. Christie.	Am. El Dorado.....	C. Thalendorst.	Louisiana.....	E. V. Gager.
Ger. Allemannia.....	Geo. Thiele.	Fr. Electrique.....	H. J. Byrne.	Ludgate Hill.....	J. Brown.
Br. Aller.....	H. Christoffers.	Am. El Monte.....	P. Charles.	Lydian Monarch.....	I. Sykes.
Alps.....	C. R. Legg.	Am. El Paso.....	R. B. Quick.	Maasdam.....	A. Potjer.
Alpha.....	S. O. Crowell.	Ger. Elsie Marie.....	H. Hirsch.	Maine.....	H. Bocquet.
Alvena.....	F. McKay.	Br. Elvaston.....	W. E. Steele.	Majestic.....	H. Parsell.
Alvo.....	David Williams.	Ger. Empress.....	T. Ridden.	Manhattan.....	I. B. Robinson.
Ambrose.....	H. J. P. Smith.	Br. Ems.....	R. Sander.	Manitoba.....	J. M. Johnston.
Ger. America.....	A. Kohlmann.	Br. England.....	A. F. Healey.	Marengo.....	W. Whitton.
Dtch. Amsterdam.....	A. Potjer.	It. Entella.....	V. Bruno.	Marie.....	T. A. Sejott.
Br. Anchoria.....	A. Campbell.	Fr. Equateur.....	A. Moreau.	Nor. Marsala.....	N. Maass.
Andean.....	H. Daniel.	Br. Er King.....	Henry Jones.	Br. Martello.....	G. Searr.
Anerley.....	W. T. Sherborne.	Br. Ethewold.....	John Wilson.	Maryland.....	H. Murrill.
Angers.....	J. Pinkham.	Am. Ethelred.....	C. Smith.	Massette.....	Jas. Ross.
Anjer Head.....	C. Pinkham.	Br. Etruria.....	W. H. P. Hains.	Mendes Nunes.....	D. J. Lopez.
Apollo.....	W. S. Morgan.	Span. Euphrates.....	J. Edwards.	Mentmore.....	R. Waite.
Adrancorach.....	W. Anderson.	Br. Euxaro.....	M. Zabalandicochea.	Mereddio.....	D. Young.
Arizona.....	S. Brooks.	Br. Exeter City.....	T. L. Weiss.	Michigan.....	W. H. Williams.
Asphodel.....	T. S. Sundars.	Am. Excelsior.....	H. L. Higgins.	Mineola.....	T. S. Evans.
Athos.....	H. Low.	Br. Federation.....	A. M. Marrs.	Minia.....	S. Trott.
Attila.....	A. Barclay.	Span. Federico.....	— Gartz.	Ministec Maybach.....	B. Schierhorst.
Aurania.....	Thos. Dutton.	Br. Ponar.....	T. H. Willis.	Minnesota.....	R. Griffiths.
Avonmore.....	C. J. Hargreaves.	Br. France.....	A. D. Hadley.	Missouri.....	A. J. Cave.
Ger. Australia.....	F. Spruth.	Br. Friesland.....	W. G. Randle.	Monkseaton.....	J. Beasley.
Br. Balcorres Brooks.....	H. Harrison.	Br. Frisco.....	J. R. Baker.	Montana.....	S. Layland.
Nor. Baltimore.....	C. W. Simpson.	Ger. Fulda.....	O. Cuppers.	Mississippi.....	H. Murrell.
Br. Banes.....	J. Kuding.	Br. Furnessia.....	J. Norris.	Monarch.....	C. B. Anderson.
Barrowmore.....	W. H. Moore.	Span. Gaditano.....	F. Goicochea.	Ger. Moravia.....	O. Winkler.
Bavarian.....	A. Bell.	Br. Gaelic.....	W. G. Pearne.	Munchen.....	C. Stencken.
Bayonne.....	J. E. Payne.	Ger. Galicia.....	W. Bocke.	Br. Naranja.....	John Sully.
Bele.....	W. Anderson.	Br. Galileo.....	W. Magee.	Span. Navarro.....	S. de Felleria.
Belg. Belgenland.....	E. Beuce.	Br. Gallia.....	J. Ferguson.	Belg. Nederland.....	F. Albrecht.
Br. Belgie.....	W. H. Walker.	Ger. Gellert.....	C. Kampff.	Nedjed.....	A. Newey.
Bellona.....	James McMillan.	Br. Germanic.....	J. G. Cameron.	Nessmore.....	J. Baxter.
Bentala.....	J. Campbell.	Ger. Gestemunde.....	D. Muller.	Neptune.....	J. Fraser.
Beacon Light.....	G. Elliott.	Br. Gilsland.....	M. L. Robinson.	Br. Nestorian.....	Isaac Goodwin.
Benito Estenger.....	E. F. Canal.	Br. Gladiolus.....	G. Wright.	Fr. Neustria.....	P. Verries.
Span. Berlin.....	J. Martin.	Br. Gladestry.....	A. Wilson.	Br. Nevada.....	J. A. R. Cushing.
Dtch. Bohemia.....	H. Leithausen.	Br. Gleneagles.....	E. F. Park.	Br. Newgate.....	W. Ramsdale.
Ger. Borderer.....	F. Manley.	Br. Glenfield.....	J. Newdick.	Am. Newport.....	C. C. Lima.
Br. Bostonian.....	W. C. Fry.	Br. Glenmavis.....	F. H. Wyse.	Belg. Noordland.....	H. E. Nickels.
Bothnia.....	J. B. Watt.	Br. Glenorchy.....	R. Ferguson.	Ger. Normannia.....	C. Heibich.
Boston City.....	H. W. Pell.	Br. Gloucester City.....	R. Jones.	Br. Norseman.....	D. H. Stenbridge.
Bremerhaven.....	C. Schmidt.	Ger. Gluckauf.....	Saymanski.	Ger. Nova Scotian.....	R. H. Hughes.
Bretwalda.....	Thos. Hunter.	Ger. Graf Bismarck.....	W. Topser.	Br. Nurnberg.....	H. Engelbart.
Britannia.....	H. Davidson.	Br. Grassbrook.....	H. Schuller.	Dtch. Obdam.....	G. Bakker.
British Empire.....	A. Smith.	Br. Grecian.....	C. E. Le Gallia.	Ger. Ocean.....	A. Voge.
British Prince.....	E. H. Freeth.	Br. Greece.....	A. J. Jeffrey.	Br. Oceanic.....	W. W. Smith.
British Princess.....	H. W. Barclay.	Ger. Gut Heil.....	D. Gerdam.	Am. Ohio.....	R. W. Sargent.
Brooklyn City.....	L. W. Henderson.	Br. Hads.....	H. Gatheman.	Ger. Ohio.....	A. Dohie.
Brunei.....	J. H. Malet.	Br. Hannover.....	Carl Hoelck.	Br. Olympia.....	I. Swain.
Buffalo.....	G. W. Muir.	Br. Hans & Kurt.....	Chas. Shurlock.	Ontario.....	W. P. Couch.
Bulgarian.....	A. Reckmann.	Dan. Handel.....	A. G. Thomsen.	Oranmore.....	W. J. Moffat.
Ger. Burgum'ter Petersen.....	John McAnbie.	Br. Hekla.....	A. Buhur.	Orkla.....	J. T. Sutherland.
Br. Caledonia.....	H. T. Garvie.	Ger. Heligoland.....	R. Lander.	Oregon.....	H. C. Williams.
California.....	H. Bauer.	Br. Hermann.....	Bodeker.	Orinoco.....	J. S. Garvin.
Ger. Camden.....	W. M. James.	Br. Hexham.....	D. Meyer.	Orizaba.....	J. McIntosh.
Br. Camellia.....	E. Penney.	Br. Hibernian.....	T. D. Adams.	Ottoman.....	E. Maddox.
Canada.....	W. Dunlop.	Br. Hindoo.....	J. M. Wallace.	Ozama.....	C. O. Rockwell.
Ger. Capua.....	G. Kuchenthal.	Br. Hohenzollern.....	Jas. Douglas.	Palestine.....	W. Whiteway.
Br. Caspian.....	R. F. Moore.	Br. Holland.....	James Buck.	Palmas.....	J. Evans.
Ger. Cassius.....	C. Rix.	Br. Hipparchus.....	Thos. Foote.	Parisian.....	J. Ritchie.
Br. Catalonia.....	J. J. Atkin.	Br. Horrox.....	A. Cadojan.	Paris.....	F. Chevalier.
Ger. Catania.....	H. M. Frank.	Span. Hugo.....	T. Hening.	Pascal.....	R. W. Trenaman.
Br. Cephalonia.....	W. S. Seccombe.	It. Iniziativa.....	A. Garteis.	Pavonia.....	A. McKay.
Br. Charles.....	P. M. Peters.	Br. Inchborow.....	B. Jamieson.	P. Caland.....	F. S. de Vries.
Fr. Chateau Lafite.....	M. C. Ollivier.	Br. Intrepid.....	Chas. E. Pain.	Patapasco.....	P. L. Moore.
Br. Chelydra.....	C. Chater.	Br. Inventor.....	A. Canzoneri.	Pawnee.....	E. Phillips.
Chicago.....	T. Elliot.	Br. Island.....	E. W. Owen.	Peconic.....	W. Harnden.
Circassia.....	J. Hedderwick.	Br. Italia.....	W. Ashley.	Pennland.....	C. H. Grant.
Circassian Prince.....	A. McDougall.	Br. Ixla.....	T. S. Hodge.	Pennsylvania.....	E. B. Thomas.
Circe.....	N. Hocken.	Br. Jamaica.....	J. Black.	Picqua.....	J. T. Lund.
City of Augusta.....	R. C. Jennings.	Br. Joshua Nicholson.....	W. Skjott.	Pocahontas.....	J. James.
Br. City of Berlin.....	F. S. Land.	Br. Kansas.....	G. Schmidt.	Pocasset.....	John Jenkins.
City of Chester.....	A. W. Lewis.	Br. Kasbek.....	W. Pearce.	Polaria.....	F. Schroeder.
City of Chicago.....	A. Redford.	Br. King's Cross.....	D. Lawson.	Polynesia.....	G. Franck.
City of New York.....	Fred. Watkins.	Br. Kronprins F. Wilhelm.....	W. Tyner.	Pontiac.....	R. Blythe.
Am. City of Para.....	J. L. Lockwood.	Br. La Bourgogne.....	A. Fenton.	Port Adelaide.....	C. Hepworth.
Br. City of Savannah.....	C. B. Googins.	Fr. La Bretagne.....	G. J. Mills.	Portia.....	T. Ash.
Br. Claibel.....	T. M. MacKnight.	Br. La Campine.....	M. v. d. Decken.	Princess Amelia.....	W. P. Horten.
Am. Colonist.....	A. Corner.	Br. La Champagne.....	E. Franguel.	Prussia.....	C. H. Calvert.
Ger. Colorado.....	W. F. Evans.	Br. La Flandre.....	M. de Jouselin.	Prins Wm. I.....	B. G. Spink.
Br. Columbia.....	H. Vogelgesang.	Br. La Gascogne.....	E. Smit.	Prins Wm. II.....	J. T. Dorr.
Br. Columbia.....	R. Garrick.	Br. Lahe.....	Boyer.	Prins Wm. III.....	H. Stewer.
Columbian.....	E. Perry.	Br. Lake Huron.....	M. W. Nines.	Prins Fred. Hendrik.....	— Karst.
Connemara.....	W. Boulton.	Br. Lake Nepigon.....	H. Hellmers.	Prior.....	A. Sibbelee.
Counsellor.....	J. G. Jones.	Br. Lake Superior.....	P. D. Murray.	Professor.....	G. Graham.
Croma.....	W. R. Lord.	Br. Lake Winnipeg.....	C. F. Herriman.	Prussian.....	R. Owen.
Cuffe.....	Robert Nicol.	Am. Lampasas.....	W. Stewart.	Prudentia.....	J. Ambury.
Dalton.....	J. Russell.		F. Carey.	Queensmoore.....	J. Treney.
Damaria.....	Wm. Lyns.		M. B. Crowell.	Recta.....	J. B. Lowe.
Ger. Dania.....	H. Barends.			Red Sea.....	W. W. Bustin.
Br. Darial.....	A. H. F. Young.			Rhaetia.....	W. Kuhlwein.
Darwin.....	T. Byrne.			Rhein.....	W. Kuhlmann.
Denmark.....	R. S. Rigby.			Rhenania.....	O. Ruhfal.
				Rhyndland.....	H. Buschman.
				Rialto.....	J. Akester.

List of merchant marine steam and sailing vessels from which International Meteorological reports were received at the office of the Chief Signal Officer, U. S. Army, Washington City, during the three months ending December 31, 1890—Continued.

Name of vessel.	Captain.	Name of vessel.	Captain.	Name of vessel.	Captain.
Br. s. s. Richard Kellsall	Geo. Olditch.	Ger. s. s. Trave	R. Bussius.	Br. schr. Calabria	John F. Farmer.
Richmond	E. S. Clapp.	Br. Trinacria	G. Mitchell.	bgt. Champion	Thos. Wood.
Richmond Hill	H. Perry.	Tripoll	E. H. Dunn.	Br. sp. Chas. S. Whitney	Geo. D. Spicer.
Ripon City	G. E. Doyle.	Umbria	H. McKay.	Clan Mackenzie	John Simpson.
Robert Dickinson	H. Tucker.	Urbino	James Warren.	Crown of Italy	T. J. Greenback.
Rochdale	F. D. Findall.	Utopia	J. M. Keague.	sp. Delvaine	C. von Lindern.
Rock Light	F. Parton.	Br. Vancouver	C. J. Lindall.	Br. Drumeltan	T. E. Cowell.
Roman	R. Williams.	Vandyck	T. Phelan.	Euphemia	H. J. Cann.
Rosshire	W. Hewat.	Vendiam	A. Roggeveen.	Am. bg. Fidelia	H. J. Jordan.
Rossmore	John Arnold.	Venetian	H. Leask.	Br. schr. G. C. Kelly	G. Strupat.
Rotterdam	H. C. v. d. Zee.	Venezuelan	A. H. Highton.	sp. General Roberts	S. Bailey.
Roxburgh Castle	G. Tyser.	Viking	F. Hasland.	Am. schr. Geo. V. Jordan	E. V. Lyman.
Rowena	Wm. Benjamin.	Ville de Donal	Dependant.	Gertrude L. Trundy	B. Loring.
Rugia	R. Karlowa.	Virginian	M. Fitt.	bk. Hannah Mc. Loon	L. M. Bird.
Runic	T. P. Thompson.	Wacslan	C. H. Grant.	bkt. Harriet S. Jackson	W. S. Bacon.
Russia	G. Schmidt.	Werkendam	W. Bakker.	Br. bg. Harry Stewart	J. B. Brinton.
Russian Prince	T. Emerson.	Werra	C. Pohle.	Am. schr. Henry A. Faber	H. E. Garlick.
Saale	B. Blanks.	Westernland	J. C. Jamison.	Harbeson Hickman	C. S. Powell.
Saginaw	R. B. Kelly.	Wetherby	J. W. Harrison.	bg. H. B. Hussey	G. W. Hodgdon.
Saint Dunstan	R. Phillips.	Wieland	H. Barends.	Nor. bk. Hermod	A. Fredricksen.
Saint Ronans	H. Campbell.	Wild Flower	S. W. Ryder.	schr. Howard B. Peck	E. Mekaffey.
St. Pancras	C. H. Young.	Wisconsin	J. P. Worrell.	Am. bk. Jennie Cushman	E. Ticom.
Salerno	G. Pickering.	Wydale	J. H. Gibson.	schr. Jennie S.	Chas. Sinclair.
Salier	A. Jager.	Worcester	L. Morice.	bg. John C. Noyes	C. E. H. Kartateen.
Sama	H. M. Hansen.	Wyoming	C. L. Rigby.	bk. John D. Brewer	W. L. Josselyn.
Samaris	T. Hewitson.	Yucatan	J. W. Reynolds.	bk. John D. Peters	O. J. Humphrey.
San Benito	H. P. Corner.	Zaandam	H. Ponsen.	schr. John Holland	L. J. Stevens.
Saratoga	C. P. Leighton.	<i>United States Naval.</i>		bk. J. H. Bowers	F. A. Magnus.
Sardinian	W. Richardson.	U. S. C. S. A. D. Bache	E. Hughes.	schr. John R. Bergen	J. H. Squires.
Sarnia	J. Gibson.	U. S. F. C. S. Albatross	Z. L. Tanner.	bk. John R. Stanhope	J. B. Norton.
Saxonia	Magin.	U. S. S. Alert	R. D. Hitchcock.	S. D. schr. Julien	E. Groningen.
Scandia	E. Kopff.	U. S. S. Boston	James O'Kane.	Ger. bk. Jupiter	F. Gerlach.
Scandinavian	J. Franco.	U. S. S. Charleston	Geo. C. Reemoy.	Br. Kelvin	J. Newman.
Seythia	T. Roberts.	U. S. S. Chicago	H. B. Robeson.	Am. Kennard	J. A. Bettencourt.
Seneca	F. Stevens.	U. S. S. Despatch	S. W. Cowles.	Br. Konoma	J. Thompson.
Servia	H. Walker.	U. S. S. Dolphin	Yates Stirling.	Lady Nairn	Thos. Richards.
Siberian	J. Park.	U. S. C. S. schr. Eagre	W. P. Elliott.	sp. Laomene	W. Randall.
Smeaton Tower	J. W. Gouffrey.	U. S. C. S. schr. Earnest	J. N. Jordan.	Ger. bk. Leocadia	A. Hagemann.
Sirius	T. P. Fisher.	U. S. S. Enterprise	G. A. Converse.	Am. sp. Light vessel No. 45	Andrew Jackson.
Spaarndam	F. H. Bonjer.	U. S. S. Fish Hawk	James Smith.	bkt. Lizzie Carter	R. H. Goodman.
Specialist	C. H. Hassack.	U. S. C. S. G. S. Blake	C. E. Vreeland.	Aus. bk. Mates	G. Vidulich.
Spain	W. A. Griffiths.	U. S. C. S. Gedney	J. M. Helm.	Am. Megunticook	E. E. Waller.
Spree	W. Willigerod.	U. S. S. Independence	Byron Wilson.	schr. Nelson Bartlett	J. W. Watts.
Standard	W. Langer.	U. S. S. Jamestown	B. F. Lambertson.	bk. Neptune	J. Fred. Hill.
State of Indiana	A. Ritchie.	U. S. S. Kearsarge	H. Elmer.	Ger. Pallas	J. H. Stege.
State of Nebraska	A. G. Braes.	U. S. C. S. S. McArthur	W. P. Ray.	Br. schr. Pearl	J. Rudols.
State of Nevada	J. A. Stewart.	U. S. S. Nipsic	F. Mc. Curley.	Ger. bk. Pillan	G. Gerlach.
State of Pennsylvania	A. J. A. Mann.	U. S. S. Philadelphia	F. Rodgers.	bk. P. M. Peterson	Storsen.
State of Texas	G. Williams.	U. S. S. Portsmouth	J. Schouler.	Nor. Prince Eugene	H. Andersen.
Stockholm City	W. Thompson.	U. S. S. Richmond	A. V. Reed.	Br. Rathemay	J. Hays.
Straits of Belle Isle	Geo. Grigs.	U. S. S. Swatara	P. H. Cooper.	Am. schr. Roger Drury	John Delay.
Stranton	G. Morrison.	U. S. S. Thetis	C. H. Stockton.	Br. bk. Salina	J. Peterson.
Strassburg	F. Rodenberg.	U. S. S. San Francisco	W. T. Sampson.	sp. Sapphire	G. W. Murray.
Stura	F. Valle.	U. S. S. Yantic	C. H. Rockwell.	Am. schr. S. B. Hubbard	A. R. Mehaffy.
Stuttgart	W. v. Schumann.	U. S. S. Yorktown	F. E. Chadwick.	Br. bk. Sodium	Wm. Andersen.
Suoria	C. Ludwig.	<i>Sailing vessels.</i>		Ger. Soli-Deo-Gloria	F. Abendroth.
Switzerland	J. Ueberweg.	Swed. bk. Adaena	B. H. Petersen.	Nor. Sven	E. Thorkildsen.
Taormina	G. W. Koch.	Ger. bk. Agnes	C. Schepler.	Am. sp. Tillie E. Starbuck	E. Curtis.
Tancorville	B. Carter.	Br. bk. Alisa Craig	R. Hazell.	Br. bk. Valona	H. Andrews.
Tentonic	P. J. Irving.	Nor. bk. Aljaca	J. Anderson.	Am. Volora Hopkins	J. E. Dow.
Teutonia	J. Marsen.	Am. bk. Anita Berwind	A. J. Biddle.	Wakefield	B. C. Howes.
Texan	T. T. King.	Ger. sp. Anna	J. Menkens.	White Wings	R. E. M. Davison.
Thanmore	A. J. Baxter.	Am. schr. Anna E. Kraus	P. F. Terentioff.	schr. W. H. Oler	E. Baker.
The Queen	T. P. Heeley.	Br. bkt. Antilla	J. W. Jones.	bk. Xenia	N. E. Reynolds.
Thingvalla	S. T. H. Laub.	Am. bg. Arcot	C. M. Haskell.	Port. Yalius	F. D. Vieira.
Thurston	Thos. Douglas.	Am. schr. Benj. C. Frith	J. T. Pales.	Br. Zimi	D. Lloyd.
Toronto	J. MacAuley.	Nor. sp. Birma	G. A. Waage.		
Tower Hill	R. Bennett.	Belg. bk. Brabant	S. Gerdes.		

ANNUAL SUMMARY FOR 1890.

The following general discussion of the weather over the United States during 1890 is based upon 7 charts, published herewith, which show, respectively, the annual mean temperature and the departure from the normal temperature; the annual mean atmospheric pressure and the prevailing wind; the maximum temperature; the minimum temperature; the absolute ranges of temperature; the annual precipitation; and the departure of the annual precipitation from the annual normal precipitation. These charts have been prepared from data received from 1,504 regular and voluntary observers of the Signal Service. An index of the MONTHLY WEATHER REVIEW for 1890 is also published herewith.

TEMPERATURE.

The annual mean temperature was highest in extreme south Florida, in the lower Rio Grande valley, and at stations in extreme southeast California, where it was above 75°; over the Florida Peninsula, along the west Gulf coast, and in the lower Colorado and middle and lower Gila valleys the mean values were above 70°. The annual mean temperature was lowest in the lower Saint Lawrence valley, in north Ontario, in Manitoba, and at elevated stations in central Colorado, where it was below 35°; the annual mean temperature was below 40° north of a line traced from Cape Breton Island westward to south North Dakota, and thence over northeast Montana into the British Possessions; and the mean values were below 50° north of a line traced from the south New England coast westward to north-central Colorado, thence southward to northeast Indian Territory, thence north of west to east California in about latitude north 38°, thence north and east of north to east-central Washington, and thence to southwest Washington; the annual mean was also below 50° in the mountains of north central Virginia and central West Virginia.

The annual mean temperature was above the normal, except on the middle and north Pacific coasts and the adjoining part of the plateau region, in north New England and northeast New York, and over south Florida. The most marked departure above the normal temperature occurred from the North Carolina coast to central Mississippi, in areas in the middle Ohio valley, the west-lower and east-upper lake region, in the Red River of the North Valley, at stations in central New Mexico and central Kansas, and in the lower Rio Grande valley, where it exceeded 1°.5, and the greatest departure below the normal temperature was noted in southwest Maine and north-central Nevada, where it was more than 2°.

Along the Atlantic coast from south New York to Georgia, and at stations in the east Gulf states, Kentucky, Tennessee, southeast Texas, west-central Arkansas, south-central Kansas, north Colorado, central New Mexico, southeast Arizona, and at Los Angeles, Cal., the annual mean temperature was the highest ever reported, the most marked departure above the highest annual mean previously reported being noted at Charlotte, N. C., and Knoxville and Chattanooga, Tenn., where it was more than 1°. At Cleveland, Ohio, Jacksonville and Pensacola, Fla., Shreveport, La., and Pittsburgh, Pa., the annual mean temperature was the same as the highest annual mean recorded for preceding years. No unprecedentedly low annual mean temperature was reported for the current year.

The highest absolute maximum temperature reported by a regular station of the Signal Service was 115°, at Yuma, Ariz., July 22d. The reports of voluntary observers show maximum temperature 120° and above in San Bernardino and San Diego counties, California, east of the San Bernardino range of mountains, and along the Colorado River in west Arizona. The maximum temperature was 110° or above in the Sacramento Valley, and from the middle San Joaquin valley southeast over southeast California and west Arizona, and was generally above 100° over the west part of the plateau region, from the Rocky Mountains to the Mississippi River, and in areas in the east Gulf and south Atlantic states. The maxi-

mum temperature was lowest in extreme northwest Washington and on the coast of north California, where it was below 80°, and the maximum values were below 90° along the immediate middle and north Pacific coasts, at elevated stations in central Colorado and north-central New Mexico, in adjoining parts of Tennessee and North Carolina, in north-central Virginia and north West Virginia, at Key West, Fla., and on the south-east and extreme east New England coasts. The highest absolute temperature ever reported by a regular station of the Signal Service was 119°, at Fort McDowell, Ariz., in June, 1887, and at Phoenix, Ariz., in June, 1883.

The lowest absolute minimum temperature reported by a regular station of the Signal Service was -43°, at Fort Buford, N. Dak., February 26th. The reports of voluntary observers show minimum temperature below -45° in east Montana. Minimum temperature below -40° was reported over north North Dakota, and in north central and east Montana. At stations in the interior of Maine, in north New Hampshire, in the upper Missouri and Red River of the North valleys, at elevated stations in central Colorado, and in northeast Nevada the minimum values were below -30°; over north New England, north-lower and east-upper Michigan, north of a line traced from east-central Wisconsin south of west to central Colorado, and thence northwest to east Washington, and in north-central and extreme west-central Nevada they were below -20°. The minimum temperature was below zero in New England, save on the south coast, in New York, save in the west and southeast parts, at mountain stations in central Pennsylvania, and north of a line traced from south Michigan west-southwest to north-central New Mexico, thence west-northwest to east California in latitude about N. 38°, and thence northward over central Oregon and Washington. The only sections in which the minimum temperature was above 32° (the freezing point) were the east Florida coast south of Titusville, extreme south Florida, along the immediate Pacific coast south of the 38th parallel, and in the lower Gila valley. The lowest absolute temperature ever reported by a regular station of the Signal Service was -63°, at Poplar River, Mont., in January, 1885.

The greatest yearly range in temperature, 143°, occurred at Fort Buford, N. Dak.; the range in temperature exceeded 120° from west Iowa north and northwest to the British Possessions, and in north-central Nevada; and it was more than 100° in north New England and northeast New York, and north of a line traced from north-lower Michigan southwestward to extreme north Texas, thence westward to west Nevada, and thence northward over central Oregon and Washington. The least yearly range in temperature occurred at Key West, Fla., where it was 41°; it was 50° at San Francisco, Cal.; less than 60° at points along the south and middle Pacific coasts and on the extreme north Pacific coast; and less than 70° over the Florida Peninsula, along the west Gulf coast, at Hatteras, N. C., and generally along the entire immediate Pacific coast.

ATMOSPHERIC PRESSURE.

The annual mean pressure was highest over the south Atlantic and east Gulf states, Florida, and Tennessee, where it was above 30.10, and was lowest over the west part of the southern plateau and along the west coast of the Gulf of Saint Lawrence, where it fell below 29.95. East of the 100th meridian and south of the Lake region, and on the middle and north Pacific coasts, the mean pressure was above 30.05.

PRECIPITATION.

The heaviest yearly precipitation reported was 99.85 inches at Neah Bay, Wash., and yearly precipitation to exceed 70.00 was reported in northwest California, central Arkansas, and central Louisiana. Along the immediate Pacific coast north of the 40th parallel and between the 36th and 37th parallels, within an area extending from east Texas and east Indian Territory northeastward to the New England coast, in east

Florida, east North Carolina, and in Nova Scotia and Prince Edward Island the yearly precipitation exceeded 50.00. The least yearly precipitation was noted in the lower Colorado and lower Gila valleys, and thence over southeast California, where it was less than 5.00 inches, and the yearly precipitation was less than 10.00 in extreme south and south-central California, thence northeastward over the middle plateau to Wyoming, and thence northward over central Colorado. The precipitation was also less than 10.00 in east Colorado and in extreme south-central New Mexico. The yearly precipitation was generally less than 20.00 from the 100th meridian to the Pacific coast ranges of mountains, and in south California.

The precipitation was in excess of the annual normal from northeast Texas and east Indian Territory northeastward over the Ohio Valley, the lower lake region, New York, and a greater part of New England and the Canadian Maritime Provinces, in extreme south Florida, parts of Wisconsin, upper Michigan, and southeast Wyoming, in the British Possessions north of North Dakota and east Montana, along the immediate middle Pacific coast, and from north California and south Oregon southeastward over Nevada and Arizona. The greatest excess in yearly precipitation occurred in the middle and upper Ohio valleys, and from west Tennessee over Arkansas, where it was more than 10.00 inches, and the excess was more than 6.00 inches from northeast Texas northeastward to west Maine.

At the following named regular stations of the Signal Service the yearly precipitation was the heaviest ever reported by the amounts given: Cleveland, Ohio, 47.82, 6.30 more than in 1879; Pittsburgh, Pa., 50.61, 7.44 more than in 1883; and Fort Smith, Ark., 64.63, 13.66 more than in 1888.

The greatest deficiency in yearly precipitation occurred on the middle coast of the Gulf of Mexico, where it exceeded 20.00 inches, and the deficiency was more than 10.00 inches generally along the Gulf and south Atlantic coasts, and in central and west Iowa. The deficiency was more than 8.00 inches in west Washington, and exceeded 4.00 inches over a greater part of the northern plateau, on the south Pacific coast, from east Colorado northeastward over Minnesota, and eastward to Illinois, in north Ontario, and in east Maine.

At the following-named regular stations of the Signal Service the yearly precipitation was the least ever reported by the amounts given: Wilmington, N. C., 41.33, 8.26 less than in 1875; Pensacola, Fla., 47.02, 5.29 less than in 1887; Mobile, Ala., 42.51, 7.37 less than in 1889; Atlanta, Ga., 42.60, 7.71 less than in 1879; New Orleans, La., 42.17, 6.28 less than in 1889; Shreveport, La., 40.54, 1.68 less than in 1887; Brownsville, Tex., 25.55, 0.26 less than in 1876; Huron, S. Dak., 14.68, 2.37 less than in 1888; Fort Assiniboine, Mont., 9.76, 0.01 less than in 1889; Denver, Colo., 9.33, 0.18 less than in 1888; Omaha, Nebr., 12.08, 7.84 less than in 1887; Salt Lake City, Utah, 10.33, 0.61 less than in 1880.

The heaviest yearly precipitation commonly occurs on the extreme north Pacific coast, where it averages nearly 100 inches at Neah Bay, Wash., and in 1886 the precipitation at that place was 123.23. On the middle and south Pacific coasts the heaviest yearly precipitation occurred in 1884, when it varied from 34.92 at Sacramento, Cal., and 38.82 at San Francisco, Cal., to 40.39 at Los Angeles, Cal., and 27.59 at San Diego, Cal. The heaviest precipitation at Yuma, Ariz., 5.86, was also reported in 1884. In other sections of the country the years of heaviest precipitation varied. In New England the heaviest yearly precipitation, 65.53, was reported at Boston, Mass., in 1878; in the middle Atlantic states, 70.72, at Norfolk, Va., in 1889; in the south Atlantic states, 102.40, at Hatteras, N. C., in 1877; in the Gulf States, 90.97, at Mobile, Ala., in 1881; in the Ohio Valley and Tennessee, 73.87, at Knoxville, Tenn., in 1875; in the Lake region, 60.24, at Buffalo, N. Y., in 1878; in the upper Mississippi valley, 61.58, at Cairo, Ill., in 1882; in the Missouri Valley, 52.06, at Leavenworth, Kans., in 1877; in the extreme northwest, 34.01, at Moorhead, Minn., in 1882; in the Rocky Mountain and plateau regions, 25.67, at Fort Assiniboine, Mont., in 1884; 23.64, at Salt

Lake City, Utah, in 1875; 33.55, at Dodge City, Kans., in 1881; and 48.45, at Fort Sill, Ind. T., in 1877.

The following are among the more notable meteorological features of the year: Over a greater part of the country east of the Mississippi River the winter of 1889-'90 was the warmest on record. On January 12th destructive local storms occurred in the middle Mississippi and Ohio valleys. During the passage of a tornado over Saint Louis, Mo., three persons were killed and several were injured, and hundreds of houses were blown down or damaged. At Clifton, Ky., 10 persons were killed and about 50 were injured, and immense damage was caused to buildings. On this date a heavy snow storm, with high wind and falling temperature, prevailed over Minnesota, the Dakotas, Nebraska, Kansas, and Iowa, and caused a general blockade of the railroads from Minnesota and the Dakotas southwestward over Kansas. On the 12th and 13th the storm along the lower lakes and on Lake Huron was one of the severest in many years, and was attended by fatalities and great destruction of property. The heaviest snow blockade ever known on the Central Pacific Railroad occurred during the latter half of the month, when about 120 miles of the railroad crossing the summit of the Sierra Nevada Mountains was blockaded. In the northern counties of Nevada the excessive snowfall caused great loss of live stock. At stations in north Montana, north Nevada, and California the month was the coldest January on record. In the early part of the month floods destroyed millions of dollars worth of property in south Missouri, east Arkansas, and north and east Texas. In the latter part of the month floods, resulting from melting snow, caused great damage in north California. A remarkable feature of the month was the enormous quantity of Arctic ice encountered near Newfoundland and the Grand Banks, where, as a rule, but little ice is encountered in January.

February was the warmest February on record in the Atlantic coast and Gulf states, and in areas in the Ohio Valley and Tennessee. A cold wave the latter part of the month caused great loss of stock on the ranges in east Oregon and northeast Nevada. The great depth of snow in the cuts along the line of the Central Pacific Railroad crossing the summit of the Sierra Nevada Mountains caused serious interruption to the train service. Lakes Erie and Huron were reported practically open to navigation. Destructive floods occurred in west Oregon and north California in the early part of the month. The rivers were generally above the danger-line in the Ohio, Cumberland, Tennessee, and lower Mississippi valleys during the latter part of the month, and great damage was caused by the overflow of streams in Ohio and west Kentucky. The Verde and Gila Rivers, Ariz., overflowed their banks, and a large storage dam on the Hassayampa River, Ariz., gave way, causing loss of life and destruction of property.

In March a great flood prevailed in the lower Mississippi valley, and at most of the important points along the lower Mississippi river the water was the highest ever known. Flood conditions also prevailed along the Ohio River and its tributaries, and at the close of the month the rivers were above the danger-line from Cincinnati, Ohio, to the Gulf of Mexico. On the 27th a group of destructive tornadoes occurred in Kentucky, south Indiana, south Illinois, and southeast Missouri. In Kentucky upwards of 100 lives were lost, and property to the value of about \$4,000,000 was destroyed. In Louisville alone the loss of life was 76, and many persons were injured, and the loss to property aggregated about \$2,500,000. At Jeffersonville, Ind., many buildings were demolished by the Louisville tornado which crossed the river at that point, without, however, an attendant loss of life. In Illinois 7 lives were known to have been lost, and the damage amounted to at least \$200,000. In southeast Missouri 4 lives were lost, while the damage to property was not heavy. Cold waves of unprecedented seasonal severity swept over the southern and southeastern states during the first and middle parts of the month, and on the 2d the heaviest snow storm in the history of that station occurred at Charleston, S. C.

In April the great flood in the lower Mississippi valley continued. Among the more important crevasses which occurred were those at Catfish Point, Miss., at the Opossum Fork levee, and at the great Morganza levee. At the close of the month not less than 15 parishes, or about one-fourth of the state of Louisiana, had been affected by the flood; about 10,000 acres had been inundated in Mississippi by the Austin crevasse which occurred March 30th; and on the Arkansas side of the river about 10,000 acres had been inundated. Water from the Nita crevasse, which occurred March 13th, had found its way into Lake Pontchartrain by means of the Manchac Passes.

In May the flood along the lower Mississippi river subsided gradually. A rise in the Red River caused the overflow of a considerable extent of country in northwest Louisiana and southwest Arkansas. Damaging floods occurred in Ontario, Canada; along the Brazos River, Tex.; in central New York and northeast Pennsylvania; along the Willamette River, Oregon; along the upper Potomac River; in Fresno and Tulare counties, Cal.; and along the Carson River, Nev. A noteworthy tornado occurred at Akron, Ohio, on the 10th. A remarkable aerolite passed over the northwest counties of Iowa on the 2d.

In June the lower Mississippi river fell below the danger-line at New Orleans, La., on the 12th, and continued to fall slowly during the month. Floods were reported along the Carson River, Nevada, in Ontario, Canada, in central New York, northern Illinois, and southern Wisconsin. Drought injured crops and vegetation in areas in the south Atlantic and Gulf states, and in the lower Missouri valley. Destructive tornadoes occurred at Bradshaw, Nebr., and in Lee, Livingston, and Pratt counties, Illinois.

In July tornadoes, destructive to life and property, occurred in Ramsey and Wabasha counties, Minnesota, at Marshall, Minn., at Wesley, Ill., and Lawrence, Mass. Damaging drought prevailed generally in Kansas, Nebraska, and Iowa, and in areas in the Ohio Valley and Tennessee, the Lake region, and the Atlantic coast states from Massachusetts to Alabama. Navigation was suspended on the upper Ohio river, and on the Cumberland River, at Nashville, Tenn., on account of low water, and the Arkansas River, at Fort Smith, Ark., was lower than at any time since April, 1887.

In August a West India cyclone moved from east of the Windward Islands to northwest of Bermuda from the 27th to 31st, with winds of hurricane force and loss of life and shipping. On the 19th a tornado occurred at Wilkes Barre, Pa., killing sixteen persons and destroying property the value of \$600,000. On the 12th the Arkansas River was lower at Fort Smith, Ark., than at any time since 1856. Considerable damage was caused by flood along the Gila River, Arizona.

In September a notable feature was the severe cold wave which advanced from the northwest over the central valleys west of the Mississippi River on the 13th, attended by unprecedentedly low temperature for the season and early frost. Destructive floods prevailed in central and western New York, central and western Pennsylvania, West Virginia, Ohio, and Connecticut from the 10th to 15th.

In October a tornado occurred in Richmond and Robeson counties, North Carolina, on the 16th. Considerable damage was caused by freshets in the Monongahela and Little Kanawha rivers, W. Va.; a freshet occurred in the Wyoming Valley, Pa., and the Cape Fear River flooded its banks near Wilmington, N. C. Very dry weather prevailed in parts of Nebraska, Kansas, Missouri, South Dakota, and south Minnesota. Destructive prairie fires occurred along the Cannon Ball, Heart, and Knife rivers, N. Dak., in the early part of the month.

November was the driest and warmest November on record in the middle, south Atlantic, and east Gulf states, and generally along the Pacific coast. A tornado occurred near Erie, Pa., on the 17th. On the 29th a destructive storm prevailed over Newfoundland, and on the 30th a heavy gale caused damage at Bermuda Island. High water and floods were reported along the Gila and Colorado rivers in west Arizona.

A notable feature of December was the unusually low temperature which prevailed over the extreme northeast part of the country and the abnormally warm weather in the north-central districts. Precipitation was deficient over a greater part of the country, the regions of greatest excess being the north Pacific coast and Cape Breton Island. A tornado passed over Jersey, Walton Co., Ga., on the 8th. Navigation closed generally on the Great Lakes, and the rivers of the north-central and northeast sections were generally closed by ice.

OCEAN FOG IN 1890.

The following table shows the number of days in each month for which fog was reported on the north Atlantic Ocean along, or near, the trans-Atlantic steamship routes, west of the 40th meridian, in 1890:

Month.	Between W. 40° and 55°.	Between W. 55° and 65°.	West of 65°.	Month.	Between W. 40° and 55°.	Between W. 55° and 65°.	West of 65°.
January	4	9	8	August	21	11	9
February	13	6	5	September	15	4	1
March	9	8	6	October	19	3	0
April	11	11	9	November	10	6	6
May	29	20	17	December	3	0	0
June	16	15	9	Totals	176	107	80
July	26	14	10				

In May, July, and October there was an unusual prevalence of fog near the Banks of Newfoundland; for other months there was less than the usual amount of fog in that region. In May and August the foggy days were in excess of the average number for the respective months, between the 55th and 65th meridians. West of the 65th meridian there was a deficiency in the number of foggy days, except in July. As shown in the discussion of ocean fog in the MONTHLY WEATHER REVIEW during the last three years the development of fog along the trans-Atlantic steamship routes west of the 40th meridian is largely dependent upon the conditions which exist in the east quadrants of general storms which advance over the ocean from the American continent.

Annual summary for 1890—Signal Service stations.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.		
	Mean annual.	Departure from normal.	Extremes for 1890.				Total 1890.	Departure from normal.	Percentage of normal.
			Max.	Date of max.	Min.	Date of min.			
<i>Alabama.</i>	°	°	°		°		Inches.	Inches.	
Auburn	65.7	.....	95	June 29	18	Mar. 2	46.34	.....	.....
Mobile	68.3	+0.8	97	June 29	25	Mar. 2	42.51	-20.59	67
Montgomery	67.1	+1.2	98	June 29	21	Mar. 2	48.18	-5.20	90
<i>Arizona.</i>									
Fort Apache	55.3	+1.1	97	July 8	8	Jan. 15	26.72	+4.12	118
Fort Bowie	60.9	-0.5	95	July 22	13	Jan. 12	17.65	-0.96	95
Fort Grant	61.5	+0.8	96	July 23	19	Jan. 15	16.74	+0.39	102
Fort Thomas	64.9	+2.6	108	July 22	18	Feb. 13	13.93	+0.68	105
San Carlos Agency	64.3	.....	109	July 22, 27	20	Feb. 13	18.62	.....	.....
Willcox	60.0	+0.3	104	July 22	14	Nov. 28	17.93	+5.54	145
Yuma	72.9	+1.0	115	July 22	30	Jan. 12	4.67	+1.61	152
<i>Arkansas.</i>									
Fort Smith	62.0	+1.4	101	July 17	7	Feb. 28	64.63	+20.63	147
Little Rock	62.8	+0.4	97	July 1	16	Mar. 1	63.72	+9.54	118
<i>California.</i>									
Eureka	50.6	-0.7	78	May 24	27	Feb. 27	55.54	.....	.....
Fresno	62.6	.....	111	July 25	24	Jan. 7, 11	8.30	-0.64	93
Keeler	60.3	-0.6	103	July 25	16	Jan. 7	3.74	.....	.....
Los Angeles	63.6	+1.4	105	June 7	34	Jan. 12	12.69	-5.71	69
Point Reyes Light .....	.....	.....	82	May 23	32	Jan. 8	25.57	+4.39	121
Red Bluff	61.5	-0.6	110	July 23	22	Jan. 14	25.60	-0.67	97
Sacramento	59.4	-0.6	102	July 25, 26	29	Jan. 8	20.95	-0.62	97
San Diego	61.7	+0.9	93	June 6	35	Jan. 11	8.02	-2.96	73
San Francisco	56.3	-0.4	86	Oct. 28	30	Jan. 5	25.43	+0.79	103
<i>Colorado.</i>									
Denver	51.0	+1.2	97	July 28	-8	Feb. 28	9.33	-5.00	65
Montrose	49.7	-0.1	96	July 28	-13	Feb. 28	9.10	-0.26	97
Pueblo	52.4	+0.4	100	July 7	-14	Feb. 28	8.31	-3.99	68
<i>Connecticut.</i>									
New Haven	49.6	+0.6	91	July 8	4	Mar. 7	48.95	-1.27	97
New London	50.5	+1.1	88	July 16	7	Mar. 7	48.85	-0.25	99
<i>District of Columbia.</i>									
Washington City	56.3	+1.2	98	July 8	13	Mar. 7	41.59	-2.85	94
<i>Florida.</i>									
Jacksonville	70.6	+0.7	97	June 27, 28	27	Mar. 2	47.52	-8.08	85
Jupiter	74.5	.....	95	June 27	33	Mar. 3	61.35	.....	.....

Annual summary for 1890—Signal Service stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.		
	Mean annual.	Departure from normal.	Extremes for 1890.				Total 1890.	Departure from normal.	Percentage of normal.
			Max.	Date of max.	Min.	Date of min.			
<i>Florida—Cont'd.</i>	0	0	0		0		<i>Inches.</i>	<i>Inches.</i>	
Key West.....	76.6	-1.3	89	June 25	48	Mar. 2	42.97	+ 2.64	107
Pensacola.....	69.0	+0.9	97	July 5	25	Mar. 2	47.02	-14.91	76
Titusville.....	71.9	.....	95	June 30	32	Mar. 17	53.33	.....	.....
<i>Georgia.</i>									
Atlanta.....	62.8	+1.7	98	June 30	17	Mar. 2	42.60	-12.37	77
Augusta.....	66.4	+1.4	103	June 29	23	Mar. 16	42.98	- 5.45	89
Savannah.....	67.6	+0.5	98	June 30	26	Mar. 16	47.46	- 4.63	91
<i>Illinois.</i>									
Chicago.....	58.8	+1.1	96	June 30	11	Mar. 1	50.51	+ 6.48	115
Springfield.....	48.8	+0.1	96	Aug. 2	- 5	Jan. 22	32.69	- 3.32	91
<i>Indiana.</i>									
Indianapolis.....	54.0	+1.7	97	June 26	4	Jan. 22	54.87	+ 9.99	122
<i>Indian Territory.</i>									
Fort Hill.....	61.0	+0.4	103	July 21	6	Feb. 28	30.90	- 0.70	98
<i>Iowa.</i>									
Davenport.....	50.5	+1.2	98	June 26	- 8	Mar. 1	26.10	- 8.68	75
Des Moines.....	49.5	+0.6	101	July 13	-18	Jan. 22	24.74	-10.39	70
Dubuque.....	48.5	+1.1	99	Aug. 2	-16	Jan. 22	43.16	+ 5.81	116
Keokuk.....	52.5	+1.0	104	July 14	- 6	Mar. 1	26.93	- 8.91	75
Sioux City.....	48.0	.....	104	July 13	-20	Jan. 16	22.25	.....	.....
<i>Kansas.</i>									
Concordia.....	53.2	+1.7	103	July 17	-14	Jan. 16	17.63	-11.23	61
Dodge City.....	54.8	+1.7	104	July 20	- 6	Feb. 27	11.72	- 8.42	58
Leavenworth.....	54.3	+0.8	102	July 14	- 6	Jan. 16	28.49	- 9.86	74
Topoka.....	53.9	.....	102	July 8	-10	Jan. 16	27.97	- 5.15	84
Wichita.....	56.4	.....	102	July 20	0	Feb. 28	24.07	.....	.....
<i>Kentucky.</i>									
Lexington.....	56.6	.....	94	July 7	6	Mar. 6	61.36	.....	.....
Louisville.....	58.6	+1.3	98	June 27	13	Mar. 6	55.41	+ 8.25	117
<i>Louisiana.</i>									
New Orleans.....	70.4	+1.0	96	July 5	30	Mar. 2	48.17	-20.85	67
Shreveport.....	66.9	+0.5	99	July 11	22	Mar. 1	40.54	-10.88	79
<i>Maine.</i>									
Eastport.....	41.2	-0.4	82	July 31	-18	Jan. 10	45.02	- 4.23	91
Portland.....	41.2	-2.4	93	July 31	- 4	Dec. 30	51.97	+ 9.29	122
<i>Maryland.</i>									
Baltimore.....	56.6	+1.0	98	July 8	12	Mar. 7	46.96	+ 2.62	106
<i>Massachusetts.</i>									
Boston.....	49.1	+0.3	95	July 31	0	Dec. 3	50.21	+ 5.17	112
Nantucket.....	49.0	+0.1	82	July 28	11	Dec. 20	43.80	.....	.....
Vineyard Haven.....	51.8	.....	92	July 16	10	Mar. 7	42.90	.....	.....
Wood's Holl.....	48.8	-0.2	81	July 16	6	Dec. 13	51.24	+ 7.14	116
<i>Michigan.</i>									
Alpena.....	42.2	+1.5	89	June 28	-13	Mar. 6	31.35	- 5.18	86
Detroit.....	49.0	0.0	96	July 8	4	Mar. 6	34.99	+ 2.04	106
Escanaba.....	41.8	+0.1	96	June 28	-21	Mar. 6	30.03	- 3.10	91
Grand Haven.....	46.8	+0.5	90	Aug. 2	- 4	Mar. 6	32.26	- 1.45	90
Lansing.....	47.7	+0.5	96	Aug. 3	- 3	Mar. 6	32.85	+ 1.27	104
Marquette.....	44.7	.....	91	Aug. 2	- 7	Mar. 7	36.25	.....	.....
Marquette.....	40.5	+0.7	91	July 28	-12	Mar. 6	34.47	+ 2.34	107
Port Huron.....	46.6	+1.6	93	July 8	2	Mar. 5	32.95	+ 1.13	104
Sault de Ste. Marie.....	38.8	.....	86	July 28	-27	Mar. 6	40.06	+10.53	136
<i>Minnesota.</i>									
Duluth.....	39.6	+1.0	92	July 13	-19	Jan. 21	24.09	- 7.96	75
Moorhead.....	38.8	+1.8	98	July 27	-31	Jan. 21	21.79	- 2.64	89
Saint Paul.....	43.5	-0.5	94	June 27	-22	Jan. 22	23.38	- 4.40	84
Saint Vincent.....	35.2	+1.8	.....	.....	.....	.....	22.09	.....	.....
<i>Mississippi.</i>									
Meridian.....	65.4	.....	97	July 7	19	Mar. 2	31.75	.....	.....
University.....	63.5	.....	100	July 12	17	Mar. 2	60.69	.....	.....
Vicksburg.....	67.5	+1.5	99	July 11	24	Mar. 1	52.23	- 5.06	91
<i>Missouri.</i>									
Columbia.....	55.3	.....	104	July 14	- 6	Mar. 1	37.88	.....	.....
Kansas City.....	54.8	+0.9	102	July 13	- 5	Jan. 16	31.82	- 6.04	84
Saint Louis.....	56.8	+0.5	98	July 7	4	Feb. 28	37.69	- 0.62	98
Springfield.....	56.7	+0.7	96	June 30	- 2	Feb. 28	52.57	+ 5.37	111
<i>Montana.</i>									
Fort Assiniboine.....	41.0	+0.7	99	July 25	-40	Feb. 26	9.76	- 4.58	68
Fort Custer.....	45.2	+0.2	100	July 9	-34	Feb. 26	0.66	- 3.19	75
Helena.....	43.9	+0.9	96	July 24	-39	Feb. 26	8.80	- 3.86	70
<i>Nebraska.</i>									
Crete.....	51.1	.....	103	July 30	-18	Jan. 16	21.69	.....	.....
North Platte.....	49.6	+0.7	103	July 26	-16	Feb. 28	12.71	- 6.14	67
Omaha.....	50.6	+1.0	105	July 13	-14	Jan. 16	23.08	-11.05	67
Valentine.....	47.2	+0.7	103	July 5	-24	Jan. 21	19.79	+ 0.31	103
<i>Nevada.</i>									
Winnemucca.....	47.3	-2.4	99	July 24	-23	Jan. 9	11.27	+ 2.83	134
<i>New Hampshire.</i>									
Manchester.....	45.8	.....	93	July 8	- 6	Feb. 23	45.70	+ 2.64	106
<i>New Jersey.</i>									
Atlantic City.....	53.1	+0.7	90	June 25	10	Mar. 7	47.30	+ 4.59	111
<i>New Mexico.</i>									
Santa Fe.....	50.4	+2.0	90	July 29	2	Jan. 15	12.88	- 1.04	93
Fort Stanton.....	52.7	.....	90	July 28	6	Mar. 1	11.87	.....	.....
<i>New York.</i>									
Albany.....	48.2	-0.8	98	July 8	- 4	Mar. 7	44.89	+ 6.26	116
Buffalo.....	47.1	+0.9	89	June 30	7	Dec. 28	46.55	+ 8.25	122
New York City.....	53.8	+1.8	95	July 8	6	Mar. 7	52.30	+ 7.05	116
Oswego.....	45.6	-0.8	93	July 8	0	Jan. 17	40.86	+ 5.51	116
Rochester.....	47.8	+1.1	95	Aug. 3	6	Dec. 28	43.99	+ 8.05	123
<i>North Carolina.</i>									
Charlotte.....	62.1	+1.8	98	June 23	19	Mar. 16	43.49	-10.61	80
Hatteras.....	63.8	+2.4	90	June 23	26	Mar. 16	55.51	-12.97	81

Annual summary for 1890—Signal Service stations—Continued.

State and Station.	Temperature—degrees Fahrenheit.						Precipitation in inches.		
	Mean annual.	Departure from normal.	Extremes for 1890.				Total 1890.	Departure from normal.	Percentage of annual.
			Max.	Date of max.	Min.	Date of min.			
<i>N. Carolina—Cont'd.</i>	0	0	0		0		<i>Inches.</i>	<i>Inches.</i>	
Raleigh	61.6	+1.9	97	June 29	20	Mar. 16	43.57	- 2.56	94
Southport	64.6	+1.9	92	June 27	21	Mar. 3	41.08	- 6.42	86
Wilmington	64.8	+1.2	100	June 27	22	Mar. 16	41.33	-15.48	73
<i>North Dakota.</i>									
Bismarck	40.8	+1.3	103	Aug. 6	-35	Jan. 16	15.75	+ 3.21	83
Fort Buford	39.8	0.0	100	July 26	-43	Feb. 26	14.24	+ 0.26	102
Fort Yates	43.9	+1.7	101	Aug. 6	-28	Jan. 16	15.71	.....	.....
<i>Ohio.</i>									
Cincinnati	56.4	+0.9	96	June 28	7	Mar. 6	47.70	+ 6.81	117
Cleveland	50.5	+1.9	97	July 8	6	Mar. 7	47.82	+10.37	128
Columbus	53.2	+1.0	96	July 8	7	Mar. 6	50.73	+10.17	125
Sandusky	51.1	+1.1	98	July 8	7	Jan. 22	38.60	+ 2.20	106
Toledo	50.7	+1.0	96	Aug. 3	5	Jan. 22	33.64	+ 1.68	105
<i>Oregon.</i>									
Astoria	50.8	-0.6	83	Aug. 13	16	Feb. 26	58.49	.....	.....
Baker City	45.4	.....	101	July 24	-14	Jan. 6	12.50	.....	.....
Portland	52.2	-0.8	96	Aug. 13	10	Feb. 26	40.38	- 8.96	82
Roseburg	52.9	0.0	95	June 30	15	Feb. 26	34.65	+ 0.06	100
<i>Pennsylvania.</i>									
Erie	49.2	+0.3	94	July 8	2	Mar. 7	47.05	+ 4.34	110
Harrisburg	52.4	.....	96	July 8	8	Mar. 7	42.63	+ 4.10	91
Philadelphia	55.0	+1.0	97	July 8	9	Mar. 7	34.02	- 6.54	84
Pittsburgh	54.1	+0.8	94	Aug. 2	5	Mar. 7	50.61	+13.13	135
<i>Rhode Island.</i>									
Block Island	49.7	+0.2	85	July 16	10	Dec. 13	31.51	-13.44	70
Narragansett Pier	49.6	+1.2	90	July 16	3	Mar. 7	55.21	+ 5.34	111
<i>South Carolina.</i>									
Charleston	67.8	+1.5	98	June 27	25	Mar. 16	47.84	- 9.14	84
Columbia	64.8	.....	99	June 15	21	Mar. 16	40.69	.....	.....
<i>South Dakota.</i>									
Fort Sully	45.8	+1.4	103	July 12	-30	Feb. 28	13.28	- 2.99	82
Huron	43.4	+0.4	103	July 28	-28	Jan. 16	14.68	- 7.63	66
Rapid City	46.9	.....	101	Aug. 6	-27	Feb. 27	14.02	- 2.91	83
Yankton	47.3	+1.1	99	Aug. 7	-22	Jan. 16	21.25	- 6.59	76
<i>Tennessee.</i>									
Chattanooga	62.3	+1.9	95	June 28	15	Mar. 2	52.42	- 4.54	92
Knoxville	60.1	+1.7	95	July 7	15	Mar. 2	49.59	- 3.56	93
Memphis	63.0	+1.4	98	July 17	17	Mar. 1	68.28	+14.17	126
Nashville	60.9	+1.6	98	June 28	16	Mar. 2	59.97	+ 3.31	106
<i>Texas.</i>									
Abilene	64.5	-0.1	99	July 22	12	Feb. 28	28.50	+ 0.42	101
Brownsville	74.6	+1.8	97	June 1	31	Mar. 1	25.55	-10.61	71
Corpus Christi	71.0	+0.8	94	June 1	28	Mar. 1	20.01	-17.29	54
El Paso	64.7	+0.7	101	June 12	19	Feb. 12	8.49	- 1.92	82
Galveston	71.1	+0.9	92	July 21	30	Mar. 1	47.80	- 4.39	92
Palestine	67.2	+1.6	97	July 21	19	Feb. 28	52.06	+ 4.61	110
Rio Grande City	75.7	+1.4	104	July 3	24	Mar. 2	16.47	- 2.20	72
San Antonio	69.5	+1.0	99	July 22	21	Mar. 1	29.77	- 3.11	93
<i>Utah.</i>									
Salt Lake City	51.3	+0.2	100	Aug. 6	- 6	Feb. 27	10.33	- 6.32	62
Taylor's Ranch	47.2	.....	100	Aug. 13	- 9	Jan. 21	7.56	.....	.....
<i>Vermont.</i>									
Northfield	40.4	.....	89	July 8	-22	Dec. 39	38.17	.....	.....
<i>Virginia.</i>									
Cape Henry	51.1	.....	99	July 8	22	Mar. 6	45.29	.....	.....
Lynchburg	58.8	+1.7	97	July 8	19	Dec. 27	38.22	- 5.59	87
Norfolk	61.1	+1.6	96	July 9	22	Mar. 3	50.22	- 1.95	96
<i>West Virginia.</i>									
Parkersburg	54.5	.....	94	July 8	4	Mar. 7	62.67	+20.70	149
<i>Washington.</i>									
Fort Canby	49.8	+1.0	85	Aug. 13	17	Feb. 26	53.95	- 6.39	89
Near Bay	49.1	.....	74	July 1	18	Jan. 2	99.85	.....	.....
Olympia	49.5	-0.3	90	Aug. 13	7	Jan. 5	35.85	-17.23	68
Spokane Falls	47.4	0.0	102	July 24	-23	Feb. 26	16.57	- 2.32	88
Walla Walla	52.8	-0.6	106	July 23	-10	Jan. 6	11.80	- 5.98	66
<i>Wisconsin.</i>									
Green Bay	43.8	+0.7	94	June 28	-23	Mar. 5	36.24	.....	.....
La Crosse	45.9	-0.1	96	July 30	-23	Jan. 20	34.77	+ 2.77	109
Milwaukee	46.4	+1.3	96	Aug. 2	-10	Jan. 22	30.09	- 2.54	93
<i>Wyoming.</i>									
Cheyenne	46.2	+1.3	92	July 29	-20	Feb. 27	14.47	+ 2.74	123
Fort Washakie	43.1	.....	93	July 9	-24	Feb. 27	7.74	- 1.86	81

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Alaska.</i>	°	°	°		°		<i>Inches.</i>	<i>Inches.</i>
Juneau	40.1		77	June	-4	Jan	93.28	
Killisnoo	39.5		75	June	1	Jan	54.57	
<i>Arizona.</i>								
Antelope Valley							27.53	
Bisbee							20.15	
Casa Grande	74.1		113	July	30	Jan	10.70	
Chiri Cahua Mountains							19.36	
Dragoon							17.38	
Dos Cabezos							10.81	
Fort Apache	55.6		97	July	9	Jan	21.49	
Fort Bowie	61.2		94	July	19	Jan	17.13	
Fort Grant	61.0		96	July	19	Jan	15.88	
Fort Huachuca			98	July	11	Jan		
Fort Lowell	67.3		109	July	20	Jan	20.23	
Gila Bend	74.2		110	July	34	Jan	7.40	
Grand Central Mill							16.48	
Holbrook	54.6		101	July	9	Feb	12.34	
Maricopa	75.3		116	July	34	Feb	8.63	
Mount Huachuca			99	May	15	Jan		
Natural Bridge							30.45	
Oro							15.94	
Pantano	68.1		110	July	27	Jan	18.71	
San Carlos			111	July	16	Jan	17.86	
San Simon	67.9		106	Sept	28	Jan	6.43	
Show Low							26.13	
Springerville							12.85	
Teviston							18.17	
Texas Hill	72.9		119	July	22	Jan	2.80	
Tucson (1)	68.2		109	July	24	Jan	15.04	
Tucson (2)	72.5		107	June	35	Jan	13.45	
Willcox	65.5		104	July	25	Jan	13.69	
Yuma	73.3		108	July	39	Jan	5.51	
<i>Arkansas.</i>								
Arkansas City							59.13	
Camden			95	July			59.98	
Conway	62.0		92	July	19	Mar	77.70	
Dardanelle							70.64	
Forrest City	64.8		98	July	22	Mar	65.07	
Fulton							40.02	
Helena							75.18	
Hot Springs							80.85	
Lead Hill	60.6	+3.0	106	July	14	Dec	58.90	-0.80
Newport							72.15	
Osceola			100	Aug	15	Mar		
Ozone	58.8		92	July	7	Feb	85.48	
Pine Bluff	65.4		98	July	18	Mar	49.29	
Stuttgart	63.0		96	July	15	Mar	63.92	
Texarkana	66.2		98	July	10	Feb	47.99	
Winslow	58.1		91	June	-4	Feb	66.20	
<i>California.</i>								
Alcatraz Island	53.4		85	Oct	26	Dec	23.33	
Almaden	58.8		94	May	28	Feb	25.59	
Anaheim	66.8		107	June	32	Jan	9.52	
Angel Island	55.4		91	Oct	29	Jan	19.55	
Antioch	62.6		107	July	25	Jan	13.92	
Aptos			90	Aug	27	Jan		
Athlone	64.2		110	July	27	Jan	11.20	
Auburn	59.6		105	July	24	Feb	34.04	
Bakersfield	66.7		109	July	30	Jan	3.50	
Barstow	63.9		114	July	22	Jan	1.89	
Beaumont	62.7		105	July	24	Feb	16.29	
Belmont	58.8		94	July	28	Jan		
Benicia Barracks	57.7		100	May	27	Jan	22.78	
Berendo	63.9		113	July	25	Jan	10.73	
Berkeley	54.5		86	Oct	31	Jan	28.79	
Bishop Creek			111	July	10	Jan		
Borden	63.3		114	July	25	Jan		
Boulder Creek	58.2		110	July	23	Jan	65.68	
Brentwood			112	July	28	Jan		
Brighton	62.4		106	July	30	Jan	16.74	
Caliente	62.9		108	July	30	Dec		
Calistoga			105	July	23	Jan		
Castroville	57.1		87	Apr	30	Jan	17.19	
Centerville	61.1		100	May	34	Jan	19.54	
Chico	61.5		111	July	28	Jan	21.78	
Cisco	43.9		87	July	10	Jan	62.36	
Colegrove							12.05	
Colfax	58.5		102	July	20	Jan	55.49	
Colton	66.7		110	July	26	Jan	7.96	
Corning	64.8		113	July	28	Jan		
Crescent City							81.50	
Delano	66.0		111	July	28	Jan		
Delta	58.7		106	July	20	Jan	70.54	
Downey			99	June	32	Jan		
Dunnigan	64.0		116	July	31	Jan	21.63	
Dunsmuir			100	May	24	Feb		
East Brother Light House							10.72	
Elmira	62.5		110	July	31	Jan	25.02	
El Verano	57.6		100	July	27	Jan	35.37	
Emigrant Gap	48.1		92	July	15	Jan	52.11	
Evergreen							18.41	
Farmington	61.7		108	July	25	Jan		
Felton	61.1		100	July	26	Jan	50.22	
Folsom	61.9		108	July	26	Jan		
Fort Gaston	55.1		105	June	24	Feb	57.98	
Fort Mason	54.4		81	Oct	35	Jan	23.42	
Fresno	66.9		112	July	29	Jan	7.63	
Galt			110	July	29	Jan		
Georgetown	56.3		98	July	18	Jan	62.83	
Gilroy	58.1		99	July	26	Jan	23.34	
Girard	57.4		99	July	17	Jan	10.75	
Goshen	64.4		110	July	26	Jan	7.63	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
California—Continued.	°	°	°		°		Inches.	Inches.
Grass Valley							55.49	
Haywards	55.4		87	July	30	Jan	21.38	
Hollister	60.0		101	July	28	Jan	13.14	
Hornbrook			99	July	-8	Jan		
Humboldt Light House							32.62	
Hydesville			86	May	24	Jan		
Indio	75.7		120	July	29	Jan		
Ione	58.4		105	July	21	Jan	22.32	
Iowa Hill	58.3		101	July	22	Jan	62.29	
Julian	59.1		96	July	24	Jan	34.05	
Keene	58.8		102	July	21	Jan	14.38	
Kingsburgh	63.0		106	July	25	Jan	6.54	
King City	57.8		100	July	22	Jan	11.24	
Knight's Landing	61.9		102	July	31	Jan	18.07	
La Grange			112	July	20	Feb		
Lathrop	62.4		105	July	30	Jan	11.54	
Laurel	58.9		101	July	29	Jan	53.78	
Lemoore	64.2		110	July	25	Jan	9.31	
Livermore	58.8		102	July	22	Jan	17.05	
Livingston			109	July	28	Feb		
Long Beach			102	June	32	Jan		
Los Angeles	64.7		106	June	32	Jan	13.87	
Los Gatos (1)	60.6		101	July	26	Jan	34.30	
Los Gatos (2)					27	Jan	37.06	
Mammoth Tank	75.8		118	July	29	Jan	1.60	
Martinez	57.8		92	July	28	Jan	23.75	
Marysville			100	July	30	Jan		
Menlo Park			96	May	28	Jan		
Modesto	61.9		107	July	21	Jan	10.51	
Mojave	64.0		116	July	23	Feb		
Montague	56.6		104	June	-6	Jan	18.30	
Monterey	55.2		86	Aug	28	Jan	15.96	
Monterey (H. del Monte)	55.9		87	Oct	28	Feb		
Mount Hamilton			88	Aug	17	Jan		
Napa	57.2		99	Aug	25	Jan	30.66	
National City	62.9		104	June	30	Jan	10.43	
Newark	59.8		92	May	28	Jan	16.44	
Newhall	61.3		110	July	21	Jan		
Niles	60.8		96	June	26	Dec	18.59	
North Hill Vineyard	62.0		104	July	28	Jan	17.24	
Norwalk	65.3		110	June	30	Jan	7.34	
Oakland (1)	56.2		90	Oct	30	Feb	26.15	
Oakland (2)	55.9		82	Apr	32	Jan	25.11	
Ontario	68.8		109	June	30	Jan		
Orland			111	July	30	Jan		
Pajaro	56.0		100	Oct	30	Feb	21.60	
Paso Robles	57.9		106	July	23	Jan	18.43	
Petaluma	58.2		100	May	28	Jan	25.05	
Placerville (1)	56.6		104	July	18	Jan	52.01	
Placerville (2)	54.4		98	July	14	Jan	51.02	
Pleasanton			105	July	27	Jan		
Point Arena L. H.							31.47	
Point Boneta L. H.							24.86	
Point Montara L. H.							19.39	
Point Reyes L. H.							24.82	
Pomona	63.6		106	Oct	27	Jan		
Porterville	65.7		110	July	30	Jan	8.87	
Presidio of San F			84	Oct	28	Feb		
Puente	64.1		106	June	32	Jan	10.67	
Red Bluff	63.6		108	July	28	Jan	24.45	
Redding	62.5		115	July	20	Jan	35.82	
Riverside	60.8		109	July	26	Jan	11.55	
Rocklin	62.7		107	July	30	Jan	22.69	
Rumsey	64.5		110	July	28	Jan	28.57	
Sacramento (1)	54.1		94	July	21	Jan	23.78	
Sacramento (2)	60.0		92	July	32	Jan	17.02	
Salinas (1)	53.9		94	Oct	30	Jan	15.04	
Salinas (2)	54.8		95	Oct	30	Jan	10.03	
Salton	73.7		118	July	22	Jan		
San Ardo			104	July	25	Jan	11.03	
San Diego Barracks	62.6		90	June	34	Jan	7.83	
San Fernando	64.5		108	July	26	Jan	10.95	
San Gabriel	64.0		106	June	28	Jan	11.80	
Sanger Junction	67.1		111	July	28	Jan	9.35	
San José	57.8		93	May	30	Jan	10.04	
San Mateo	54.9		86	May	30	Jan	21.45	
San Miguel			105	July	25	Jan		
San Pedro	64.6		100	Aug	35	Jan	6.51	
Santa Ana	65.6		106	Aug	32	Jan	12.88	
Santa Barbara (1)	60.2		98	Aug	34	Jan	15.49	
Santa Barbara (2)	62.6		95	Aug	28	Jan	15.69	
Santa Clara			89	May	29	Jan		
Santa Cruz (1)	59.7		93	July	32	Jan	25.30	
Santa Margarita	54.4		104	July	20	Jan	26.59	
Santa Maria	58.0		92	June	29	Jan	17.18	
Santa Monica	63.2		89	June	30	Jan		
Santa Paula			99	June	34	Jan		
Santa Rosa	56.2		100	July	27	Jan	31.08	
Selma	63.8		107	July	27	Jan	9.10	
Seven Palms	74.1		122	July	32	Jan		
Shingle Springs			105	July	20	Jan		
Sims	54.8		105	July	10	Jan	75.04	
Soledad	56.7		92	Aug	26	Jan	9.59	
Soquel	59.8		88	Oct	29	Feb		
Spadra	64.0		108	June	30	Jan	9.54	
Steeles	58.3		92	Aug	32	Jan	19.59	
Summit			82	Aug	5	Jan		
Suisun City	59.8		103	July	30	Jan	22.60	
Susanville	51.0		100	July	-10	Feb	24.86	
Tehachapi	54.4		93	July	14	Feb	6.73	
Tehama	64.4		112	July	32	Jan	14.60	
Templeton	58.6		108	July	25	Jan	19.34	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
California—Continued.								
Towles	54.1		98	July	14	Jan		
Tracy			110	July	27	Jan		
Traver	63.8		104	July	25	Jan	10.21	
Tropico	63.8		104	June	28	Jan		
Truckee	43.6		92	July	22	Feb	39.40	
Tulare	66.2		111	July	31	Jan	8.22	
Turlock	63.4		106	Aug	29	Jan	9.68	
Upper Mattole	56.9		106	May	26	Feb	90.05	
Vacaville (1)	60.7		107	July	30	Jan	31.39	
Vacaville (2)	61.2		107	July	22	Dec	28.57	
Valley Springs	60.3		102	July	28	Jan	24.30	
Vina	63.4		108	July	28	Jan	18.72	
Volcano Springs	77.2		126	July	29	Jan		
Volta	63.3		106	July	28	Jan	7.56	
Walla Walla Creek	48.8		94	July	3	Feb	35.53	
Walnut Creek	58.9		113	July	27	Jan	20.38	
Westley	65.8		105	July	28	Jan	9.27	
Wheatland	59.5		106	July	27	Jan	19.51	
Whittier	66.2		106	June	35	Jan	9.15	
Williams	60.6		109	July	26	Jan	14.30	
Willow (1)			107	July	26	Jan		
Willow (2)	59.4		108	July	28	Jan	15.81	
Winters	65.8		110	July	31	Jan	28.22	
Woodland	66.1		100	July	28	Jan	16.40	
Yerba Buena L. H.							21.85	
Colorado.								
Agate			100	July	16	Feb		
Bennet	45.7		108	July	18	Jan		
Breckenridge	39.5		87	July	31	Mar		
Brush							7.35	
Byers	53.6		102	July	8	Feb		
Canon City			101	Aug	9	Feb		
Climax	39.5		68	July	10	Feb	27.69	
Deer Trail			99	July	10	Jan		
Delta	59.3		100	July	8	Feb	9.17	
Eagle Farm							13.86	
First View			104	Aug	10	Feb	11.33	
Fort Collins	47.9		95	Aug	20	Feb	11.41	
Fort Crawford			92	Aug	11	Feb		
Fort Lewis	44.3		89	Aug	17	Jan	24.27	
Fort Logan	51.1		97	July	11	Feb	7.84	
Fruita	51.7		104	July	17	Jan	6.73	
Georgetown	43.2		82	July	6	Feb	11.72	
Hugo	52.3		100	July	6	Feb		
Husted			100	July	15	Feb		
Kit Carson	55.7		98	July	6	Feb		
Lamar			106	July	5	Feb		
Las Animas	53.5		103	July	11	Jan		
Magnolia			105	July	3	Jan		
Monte Vista	43.0		90	July	20	Jan	6.59	
Morraine			88	July	12	Feb		
Parachute							8.38	
River Bend			112	July	13	Feb		
Rocky Ford	51.0		104	July	10	Jan	6.05	
San Luis Exp. Station	41.0		89	Aug	16	Jan	8.76	
Sedgwick							6.89	
T. S. Ranch	51.6		99	July	5	Feb	11.39	
Thon	48.5		98	July	10	Feb	8.13	
Watkins	50.7		98	July	8	Feb		
Westcliffe			86	July	15	Feb		
Connecticut.								
Canton			93	July	4	Mar	51.78	
Colchester	48.6		91	July	2	Mar		
Falls Village							51.16	
Fort Trumbull	51.8		93	July	5	Dec	47.70	
Hartford (1)	48.9		93	July	5	Dec	50.72	
Hartford (2)							50.01	
Lebanon							49.10	
Mansfield	46.6		89	July	7	Mar	48.87	
Middletown	48.5	+ 1.1	94	July	7	Dec	51.60	+ 12.77
New Hartford (1)	42.4		98	July	9	Mar	49.71	
Southington	48.1		92	July	5	Dec	47.18	
South Manchester							47.88	
Uncasville							59.73	
Voluntown	48.7		92	July	17	Mar	53.92	
Wallingford							49.69	
Waterbury	48.1		96	July	3	Dec	51.52	
West Simsbury							48.39	
Delaware.								
Kirkwood	54.3				10	Mar		
District of Columbia.								
Washington B'ks	55.9		99	July	15	Mar	35.07	
Florida.								
Alva	71.9		98	Aug	39	Mar	48.96	
Fort Barrancon	69.9		96	July	35	Mar	61.15	
Fort Meade	70.7		91	June	22	Mar		
Homeland	76.9		96	June	25	Mar	53.10	
Madison			95	June	28	Mar		
Manatee			95	June	26	Mar		
Merritt's Island	73.6	+ 1.9	96	June	34	Mar	49.51	- 6.98
St. Francis Barracks			95	June	28	Mar	52.27	
San Antonio	70.6		95	June	30	Dec		
Tallahassee	67.7		93	June	23	Mar	55.57	
Villa City	71.2		98	Aug	35	Mar	33.83	
Georgia.								
Athens (1)	62.7		96	July	19	Mar	56.15	
Athens (2)	63.5		105	June	18	Mar	60.80	
Diamond	58.7				15	Mar	93.37	
Forsyth	66.9	+ 1.8	101	June	22	Mar	44.35	- 7.03
Fort McPherson			101	June	10	Mar	45.82	
Gillsville			96	June	24	Mar		
Hephzibah			93	June	26	Mar		

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
Georgia—Continued.								
Louisville.	0	0	0	0			Inches.	Inches.
Marietta.	60.6		94	June	22	Mar	52.56	
Milledgeville.	65.0		99	June	21	Mar	47.38	
Millen.			105	June	21	Mar		
Monticello.	62.5				22	Mar	51.51	
Point Peter.	61.1				21	Mar		
Quitman (1).					24	Mar	50.12	
Idaho.								
Boise Barracks.	49.1		106	July	12	Jan	11.72	
Era.	40.9		92	July	30	Feb	16.67	
Fort Sherman.	47.0		98	July	27	Feb		
Kootenai.			100	July	26	Feb		
Mullan.	41.5		102	July	27	Feb		
Illinois.								
Aurora (1).	47.5		98	Aug	10	Mar		
Aurora (2).					7	Jan	37.70	
Beardstown.							24.02	
Beason.	50.9		99	July	2	Jan	27.07	
Belvidere.	47.2		95	June	26	Mar	36.44	
Collinsville.			98	July	6	Jan		
East Peoria.	55.2		104	Aug	0	Jan	26.33	
Fort Sheridan.	48.5		98	Aug	7	Jan	38.94	
Golconda.	58.4		97	July	11	Mar	55.63	
Grand Tower.							48.59	
Greenville.	54.4		103	July	3	Jan	39.37	
Griggsville.	54.4		93	July	2	Jan	27.92	
Hennepin.			102	Aug	7	Mar	30.94	
Jordan's Grove.			98	July	2	Mar		
Lacon.	51.2		98	June	3	Mar	29.64	
Lanark.			94	June	11	Mar		
Louisville.	54.5		100	July	4	Jan	47.29	
Martinsville.	55.2				6	Dec	43.10	
Mascoutah.			103	July	2	Mar		
McLeansborough.			106	July	4	Mar		
Mount Carmel.							59.22	
Olney.	54.5		99	July	8	Dec	53.51	
Oswego.	48.0		100	Aug	10	Mar	34.71	
Ottawa.	52.0		102	July	2	Jan	31.81	
Palestine.	53.6		97	July	6	Mar	49.67	
Pana.	56.3		100	July	2	Mar	49.64	
Peoria (1).							24.39	
Peoria (2).	54.1	+ 1.9	102	July	2	Jan	25.26	— 9.89
Phil.	52.4		100	June	4	Jan	35.14	
Pontiac.	51.5		104	Aug	4	Jan	29.27	
Riley.	46.3	+ 0.9	96	Aug	13	Mar	30.44	— 0.01
Rockford.	47.7		97	Aug	18	Mar	43.71	
Rock Island Arsenal.	49.7		102	Aug	11	Mar	33.49	
Rushville.	51.5		106	July	2	Jan	30.35	
Sycamore.	47.0		98	Aug	11	Mar	29.35	
Watseka.			101	Aug	2	Jan		
White Hall.	56.2		100	July	2	Mar	28.47	
Winnebago.	49.7		100	Aug	15	Mar	30.11	
Indiana.								
Angola.	52.1		103	July	2	Mar	40.15	
Bullerville.	54.0		96	June	1	Mar	52.62	
Columbia City.	50.9		95	Aug	0	Mar	43.19	
Columbus.	53.9		97	July	3	Mar	46.29	
Connorsville.	52.7		95	July	4	Mar	42.34	
De Gonia Springs.	57.2		93	July	5	Mar	58.90	
Delphi.	49.8		95	Aug	1	Jan	40.96	
Evansville.							56.15	
Farmland.	53.3		96	July	4	Jan		
Franklin.	53.0		98	Aug	5	Mar	46.45	
Huntington.							37.82	
Jeffersonville.	57.2		96	July	2	Mar	58.32	
La Fayette.	52.7		98	June	3	Jan	42.52	
Logansport (1).							52.18	+11.71
Logansport (2).	51.0		99	July	1	Jan	42.09	
Marengo.			98	June	0	Mar		
Marion.			97	June	1	Jan		
Mauzy.	50.4		99	July	1	Mar	45.44	
Mount Vernon (1).							56.12	
Muncie.	54.9		104	June	8	Jan		
Point Isabel.	49.2		95	July	0	Jan	56.23	
Princeton.	55.4		101	June	3	Dec	56.96	
Rushville.							48.04	
Seymour.	56.3		95	July	4	Mar	49.88	
Vevay.	56.7	+ 1.3	96	July	2	Mar	60.73	+17.47
Vincennes.							53.65	
Worthington.	52.9		96	June	4	Dec	52.74	
Indian Territory.								
Eufaula.							49.02	
Fort Reno.	60.4		105	July	0	Feb	28.79	
Fort Sill.	62.2		106	July	5	Feb	31.08	
Fort Supply.			105	July	1	Feb		
Guthrie.	62.2		108	Aug	6	Feb	30.02	
Hedlton.	64.0		100	Aug	10	Feb	39.51	
Tulsa.							34.15	
Iowa.								
Alta.	45.4		99	July	20	Jan	32.60	
Amasa.	48.2		100	July	18	Jan	27.91	
Ames.			100	July		Jan		
Bancroft.	44.5		98	July	20	Jan	27.36	
Belle Plaine.	46.9		102	Aug	16	Jan	29.32	
Blakeville.			102	Aug	18	Jan		
Carroll.	47.1		99	July	20	Jan	30.44	
Carson.	49.7		106	July	0	Jan	22.90	
Cedar Rapids.	49.1		98	July	13	Jan	36.27	
Clarinda.	50.7		105	July	17	Jan	27.72	
Clinton.	49.0		101	Aug	19	Mar	32.22	
Creco.	43.2	+ 1.1	97	Aug	21	Jan	35.18	+ 3.24
Eagle Grove.	47.6		96	July	25	Jan	45.05	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Iowa—Continued.</i>	°	°	°		°		<i>Inches.</i>	
Fayette	52.2		98	July	-27	Jan	34.11	
Fort Madison	51.8		100	July	-5	Jan	27.23	
Glenwood (1)	48.5		110	July	-20	Jan	38.88	
Grinnell	48.5		98	July	-13	Jan	32.90	
Hampton	43.5		97	July	-21	Jan	35.11	
Humboldt	45.8		96	July	-22	Jan	29.50	
Independence	46.4		92	July	-19	Jan	43.12	
Iowa City	48.8		93 ^{1/2}	July	-10	Jan	38.33	
Larrabee							32.24	
Le Claire							44.95	+ 7.01
Logan	50.6	+ 2.1	100	July	-20	Jan	21.17	
Manson	45.5		100	July	-22	Jan		
Maquoketa	48.2		99	July	-15	Mar	31.24	
McCausland	50.4		100	Aug	-10	Mar		
Monticello	47.3	+ 1.4	98	July	-16	Mar		
Mount Pleasant	50.1		96	July	-6	Jan		
Mount Vernon			96	Aug	-15	Jan		
Muscataine			100	July	-15	Mar		
Osage	50.2		100	July	-17	Jan	37.24	
Oskaloosa (1)	53.0		98	July	-22	Jan	16.54	
Sac City	45.5		99	July	-19	Feb	23.53	
Storm Lake	46.7		98	July	-18	Jan	28.84	
Vinton	51.9		102	July	-8	Jan	33.58	
Washington	45.4		100	July	-20	Jan	22.88	
Webster City			95	July	-21	Jan	31.27	
Wesley	44.4		95	July	-20	Jan	32.28	
<i>Kansas.</i>								
Abilene	49.8		104	July	-12	Jan		
Allison			108	Aug	-14	Jan	15.72	
Buffalo Park			110	July	-10	Feb		
Burr Oak			106	July	-15	Jan	15.84	
Cawker City			112	July	-11	Jan		
Collyer			120	June	-8	Feb	16.05	
Concordia			105	July	-22	Jan		
Cunningham	54.6		108	Aug	-8	Feb	20.42	
Downs							14.52	
Elk Falls			102	Aug			23.12	
Englewood	57.6		107	July	0	Feb	21.68	
Eureka Ranch	55.8		117	July				
Fort Leavenworth (1)			104	July	-9	Jan	30.88	
Fort Leavenworth (2)	52.2		98	July	-8	Jan	27.80	
Fort Riley	54.0		103	July	-12	Jan	22.09	
Fremont	53.6		110	June	-21	Jan	14.87	
Globe	51.4		102	July	-7	Jan	36.19	
Gove City	53.9		120	July	-3	Jan	11.01	
Grainfield			108	July	-9	Feb	13.45	
Grenola	56.8		109	Aug	-1	Feb	25.50	
Grinnell			116	July	-9	Feb	14.26	
Havensville	51.4		111	July	-10	Feb	33.77	
Horton	54.2		107	July	-15	Jan	30.35	
Independence	58.0		105	Aug	0	Feb	30.77	
Kansas City	54.4		107	July	-5	Jan	29.03	
Kellogg	58.3		115	Aug	-4	Feb	31.73	
Kirwin							13.89	
La Harpe	54.1				-6	Jan	35.93	
Lakin	54.3		107	July	-6	Feb		
Lawrence	53.9	+ 0.4	100	July	-5	Jan	36.32	+ 1.36
Lebo	55.0		104	July	-5	Jan	42.54	
Leoti			107	July	-10	Feb		
Lincoln			104	July	-5	Jan		
Luray			114	July	-10	Jan		
Macksville			106	July	-7	Jan		
Manhattan (1)							26.13	
Manhattan (2)	52.8		107	July	-19	Jan	23.02	
Manhattan (3)	53.1		108	July	-18	Jan	24.99	
McAllaster			105	June	-13	Feb		
Minneapolis	53.6		106	July	-11	Jan	17.50	
Monmouth			110	June	-12	Jan	13.46	
Morse	53.6		102	July	-10	Jan	37.08	
Oberlin							14.83	
Offerle			108	July	-5	Feb		
Ogallah			108	July	-6	Feb		
Oswego	58.2		107	Aug	0	Feb	38.53	
Quenemo			108	Aug	-4	Jan		
Quinter			114	July	-12	Feb		
Rome	56.9		108	July	-1	Feb	22.14	
Salina	55.0		103	July	-6	Jan	18.07	
Sedan	58.2		107	Aug	0	Feb	32.34	
Shields			106	July	-12	Feb		
Tribune	52.5		106	July	-9	Feb	11.99	
Wakefield							24.07	
Wa Keeney			110	July	-4	Feb		
Wellington			112	July	0	Feb		
Weskan			112	Aug	-5	Feb	9.80	
Winona			107	Aug	-11	Feb		
Yates Centre							34.25	
<i>Kentucky.</i>								
Bowling Green							63.01	
Burnside							67.32	
Catlettsburgh							65.35	
Canton	59.1		100	July	15	Mar	53.80	
Earlington	59.1		96	July	10	Mar	51.85	
Eddyville							48.17	
Falmouth (1)							52.34	
Frankfort (1)							57.71	
Frankfort (2)	56.1		100	July	6	Mar	58.61	
Franklin	59.5		96	July	17	Mar	63.71	
Greensburg							59.23	
Louis	55.1		94	June	7	Mar	63.32	
Mount Sterling	55.6		96	July	7	Mar	61.82	
Newport Barracks							47.88	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Kentucky—Continued.</i>	o	o	o		o		<i>Inches.</i>	<i>Inches.</i>
Paducah.....			101	Aug.			50.98	
Pellville.....	58.0		101	Aug.	4	Mar.	53.04	
Princeton.....	58.1		100	July.	11	Mar.	64.79	
Shelbyville.....	58.2		99	July.	4	Mar.	65.45	
<i>Louisiana.</i>								
Abbeville.....			93	June.	27	Mar.		
Alexandria.....							76.10	
Amite City.....	58.7		98	July.	21	Mar.	61.53	
Baton Rouge.....	59.0		98	July.	26	Mar.	52.07	
Cameron.....	71.0		102	July.	23	Mar.	50.38	
Clinton.....	67.6		102	July.	23	Jan.	62.25	
Coushatta (1).....							61.10	
Coushatta (2).....			100	Aug.	20	Mar.		
Crowley.....	69.6		92	July.	25	Mar.		
Delhi.....	69.8						57.93	
Edgard.....	69.8		93	July.	31	Mar.	54.67	
Emilie.....	69.3		97	July.	22	Mar.	52.88	
Farmerville.....	66.0		95	July.	20	Feb.	51.74	
Grand Coteau.....	69.4	+ 0.8	93	July.	26	Mar.	63.37	
Hammond.....			96	June.	22	Mar.	50.34	-15.16
Houma.....			93	July.	25	Mar.		
Jackson Barracks.....			97	July.	25	Mar.	52.60	
Jeanerette.....	69.8		97	Aug.	23	Mar.	63.71	
La Fayette.....			98	July.	26	Mar.		
Lake Charles.....	67.1		100	July.	20	Feb.	58.10	
Liberty Hill.....	66.6		101	July.	19	Mar.	57.12	
Luling.....			96	July.	23	Mar.		
Mandeville.....	70.6		101	June.	22	Mar.	42.97	
Marksville.....			98	July.	20	Mar.		
Maurepas.....	68.5		96	July.	22	Mar.	50.84	
Mellville.....	69.2		96	July.	25	Mar.	58.72	
Minden.....			99	July.	20	Mar.		
Monroe.....			96	July.	20	Mar.		
New Iberia.....			95	July.	25	Mar.	50.29	
Plaquemine.....			102	July.	22	Mar.		
Port Eads.....			92	July.	40	Feb.		
Shell Beach.....			94	July.	24	Mar.		
Sugar Ex. Station.....	69.1		95	July.	27	Mar.	51.53	
Thibodaux.....							42.54	
<i>Maine.</i>								
Bar Harbor.....	43.7		86	July.	-12	Jan.	52.38	
Belfast.....	42.5		84	July.	-8	Dec.		
Calais.....	42.3		90	Aug.	-18	Jan.	54.46	
Cornish.....	43.9		92	Aug.	-7	Dec.	60.63	
Fairfield.....	41.3		92	Aug.	-26	Dec.	43.07	
Farmington.....	39.2				-20	Dec.	45.21	
Fort Preble.....							48.25	
Kennebec Arsenal.....	41.3		88	July.	-20	Dec.	32.66	
Kent's Hill.....	40.9		88	Aug.	-12	Dec.	45.54	
Lewiston.....	41.7		93	Aug.	-16	Dec.	52.75	
Orono.....	41.8	- 0.3	90	Aug.	-36	Dec.	53.03	+ 5.19
Petit Menan.....	43.2		93	July.	-8	Jan.	53.03	
West Jonesport.....	41.6		76	July.	-12	Jan.		
<i>Maryland.</i>								
Barren Creek Springs.....	56.4		93	July.	13	Mar.	48.02	
Cumberland (1).....	53.2	+ 3.3	94	July.	3	Mar.	52.42	+20.40
Cumberland (2).....	55.9		100	July.	4	Mar.	48.72	
Fallston.....					7	Mar.	56.16	
Fort McHenry.....	54.9		93	Aug.	10	Mar.		
Frederick.....	56.1		97	July.	12	Mar.	44.52	
Gaithersburgh.....	51.4				11	Mar.		
McDonogh.....	54.2		92	July.	9	Mar.	46.30	
Woodstock.....			96	July.	10	Mar.		
<i>Massachusetts.</i>								
Amherst.....	47.6	- 0.4	94	July.	-6	Mar.	49.19	+ 7.05
Amherst Ex. Station (1).....	46.4		92	July.	-10	Mar.	46.32	
Amherst Ex. Station (2).....			94	July.	-6	Mar.		
Andover.....	47.1		92	July.	-1	Mar.		
Blue Hill (summit).....	46.1		93	July.	-1	Dec.	50.85	
Blue Hill (base).....	47.7		92	July.	0	Dec.		
Blue Hill (valley).....	47.5		94	July.	-3	Feb.	48.73	
Boston.....							46.23	
Brewster.....	50.1		95	July.	7	Dec.	45.78	
Cambridge (1).....	47.4		91	July.	0	Feb.	43.71	
Cambridge (2).....	48.2		93	July.	2	Dec.	55.80	
Chestnut Hill.....	48.6		94	July.	-2	Feb.	50.21	
Clinton.....							46.83	
Cotuit.....	48.6		90	July.	5	Dec.	50.46	
Deerfield.....	47.3		98	July.	-9	Dec.		
Dudley.....	47.5		90	July.	-2	Mar.	44.67	
Fall River (1).....	48.6		90	July.	4	Mar.	58.47	
Fiskdale.....							45.55	
Fitchburg (1).....	45.9		92	July.	-4	Dec.	51.89	
Fitchburg (2).....	46.4		92	July.	-6	Dec.	54.84	
Fort Warren.....	45.8		90	July.	2	Mar.	41.79	
Framingham.....	48.6		95	July.	-3	Mar.	52.67	
Gilbertville.....	46.9		92	July.	-6	Dec.	55.64	
Groton (1).....	47.6		92	July.	-7	Feb.	53.61	
Heath.....	44.8		93	July.	-8	Dec.		
Kendall Green.....			94	July.	-4	Feb.	50.74	
Lake Cochituate.....	47.8		97	July.	-5	Feb.	51.23	
Lawrence.....	47.8		100	July.	-3	Dec.	50.58	
Leicester.....	45.5		90	July.	-2	Dec.	52.57	
Leominster.....							54.18	
Long Plain.....	49.2		90	July.	1	Dec.	62.54	
Lowell (1).....	47.1		92	July.	2	Feb.	51.00	
Lowell (2).....	46.7		94	July.	-2	Feb.		
Lowell (3).....	48.2		98	July.	0	Dec.		
Ludlow (1).....	46.7		94	July.	-8	Dec.	51.51	
Ludlow (2).....	46.5		94	Aug.	-13	Mar.	54.81	
Lynn.....			91	July.	-1	Dec.		
Mansfield.....	47.8		94	July.	-2	Mar.	55.72	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.					Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.
			Max.	Month.	Min.	Month.	
<i>Massachusetts—Continued.</i>	°	°	°		°		Inches.
Medford	47.7		91	July	0	Jan	47.33
Middleborough	47.4		94	July	0	Feb	33.81
Milton	47.4		94	July	0	Feb	31.30
Monson	46.2		98	July	-10	Dec	47.66
Mount Nonotuck							48.69
Mystic Lake							50.27
Mystic Station							47.05
Nahant	48.1		91	July	6	Feb	
New Bedford (1)	47.8		90	July	3	Dec	61.23
New Bedford (2)	49.1		93	July	3	Mar	59.01
Newburyport (1)	47.2	+ 0.6	94	July	-3	Feb	50.70
Newburyport (2)							41.73
Northampton	48.8		96	July	0	Mar	54.30
North Billerica	48.4		97	July	0	Dec	48.14
Roberts' Dam							50.96
Royalston			90	July	0	Mar	
Salem (2)							49.50
Somerset	51.3	+ 1.8	99	July	0	Mar	55.72
Springfield Arm'y	48.7		95	July	0	Dec	54.88
Taunton (1)	49.0		94	July	2	Dec	52.95
Taunton (2)	49.4		93	July	2	Mar	54.07
Taunton (3)	48.4		94	July	-4	Mar	54.38
Wakefield			93	July	-3	Feb	51.37
Wellesley	49.0		93	July	-4	Mar	
Westborough	48.8		98	July	-2	Dec	47.62
Winchester							47.04
Worcester (1)	47.3		94	July	-2	Dec	
<i>Mexico.</i>							
La Laguna			102	July	41	Jan	
Leon de Aldemas	64.3		93	May	34	Dec	33.89
Mazatlan			90	Aug	61	Jan	
Zacatecas	57.7		89	June	23	Feb	26.39
<i>Michigan.</i>							
Adrian	48.8		102	Aug	2	Mar	45.06
Albion (1)	49.1		95	Aug	2	Mar	41.26
Allegan							38.37
Alma	46.4		94	June	-11	Mar	34.32
Ann Arbor	48.2		93	Aug	0	Mar	35.35
Arbela							29.86
Atlantic			91	July	-10	Mar	27.24
Ball Mountain	45.1		94	Aug	-1	Mar	32.80
Bangor	50.1		104	Aug	-7	Mar	40.32
Bea Lake	43.3		91	June	-22	Mar	32.69
Bell Branch			94	July	2	Jan	
Benton Harbor	52.1		100	Aug	-4	Mar	39.62
Berlin	48.2		101	Aug	-3	Mar	44.39
Berrien Springs (1)	48.0		99	Aug	-5	Mar	44.56
Birmingham	48.0		96	Aug	-3	Mar	35.29
Bronson	46.2		94	Aug	-3	Mar	33.70
Calumet	39.9		91	July	-8	Mar	27.37
Cassopolis	49.3		96	Aug	-3	Mar	40.29
Caldwell	43.3		94	June	-21	Mar	32.40
Charlevoix	43.2		92	July	-26	Mar	29.88
Chelsea			98	Aug	0	Mar	
Clinton	48.9		95	Aug	2	Mar	31.89
Colon	46.2		95	Aug	0	Mar	39.32
Concord	47.6		97	Aug	-1	Mar	32.53
Crystal Falls	39.0		91	July	-26	Mar	24.26
Eden	48.2		96	June	-5	Mar	37.63
Evart			90	June	-27	Mar	
Fitchburg			97	Aug	-2	Mar	42.21
Flint			99	Aug	-4	Mar	
Fort Brady			94	July	-34	Mar	33.37
Fort Mackinac	40.3		81	July	-14	Mar	28.50
Fort Wayne	48.9		97	July	3	Mar	38.44
Freemont	45.7		95	June	-13	Mar	29.40
Grand Rapids	47.7		100	June	0	Mar	26.60
Grape	49.6		99	June	0	Mar	30.44
Grayling	42.9		95	June	-35	Mar	32.51
Gulliver Lake			90	June	-26	Mar	
Hanover	49.3		96	Aug	1	Mar	34.88
Harrison	43.4		95	June	-14	Mar	
Harrisville	42.1		94	July	-14	Mar	30.87
Hart	47.6		96	Aug	-15	Mar	32.23
Hastings	48.0		94	June	-2	Mar	36.36
Hayes	46.7		91	June	-7	Mar	26.04
Highland Station	46.2		95	Aug	-1	Mar	32.71
Hillsdale	49.2		96	Aug	0	Mar	32.95
Hudson	47.4		98	Aug	-3	Mar	38.81
Ionia			99	Aug	0	Jan	
Ivan	43.5		98	June	-19	Mar	31.43
Jeddo	47.5		90	July	0	Mar	34.85
Kalamazoo	49.4	+ 1.8	100	Aug	0	Mar	35.99
Lathrop	40.7		94	July	-26	Mar	34.14
Madison	49.1		98	Aug	1	Mar	34.36
Manton	42.9		94	June	-21	Mar	33.02
Marshall	48.1		99	Aug	-2	Mar	39.21
May	46.6		98	Aug	-6	Mar	31.69
Montague	45.2		89	June	-11	Mar	30.88
Mottville	49.1		101	Aug	-3	Mar	35.96
Noble							35.85
North Marshall			97	Aug	-4	Mar	35.26
Olivet	46.3		99	Aug	-5	Mar	32.79
Otsego	48.3		99	Aug	-4	Mar	40.97
Ovid	47.0		98	Aug	-5	Mar	31.63
Parkville							46.35
Paw Paw	49.1		99	Aug	-10	Mar	34.71
Pontiac	48.0		89	Aug	4	Mar	42.26
Pulaski	47.5		95	July	0	Mar	31.64
Rawsonville	49.7		100	Aug	3	Mar	34.07
Roscommon	41.3		93	June	-32	Mar	35.55
Saint Ignace	40.4		85	July	-23	Mar	37.67

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Michigan—Continued.</i>	°	°	°		°		<i>Inches.</i>	<i>Inches.</i>
Saint John's	47.1		97	June	-3	Mar	31.04	
Sand Beach	44.0		93	July	-3	Mar	34.93	
Stanton	45.6		96	Aug	-10	Mar	36.14	
Stockbridge							33.39	
Thornville	48.1	+ 0.7	98	Aug	-3	Mar	39.76	+ 5.61
Vandalia	48.8		96	Aug	-2	Mar	40.11	
Vienna							32.45	
Washington	46.9		95	Aug	0	Mar	37.00	
Weldon Creek	44.9		94	June	-17	Mar	32.96	
West Branch	43.9		92	June	-13	Mar	26.80	
Williamston	49.7		95	Aug	0	Mar	38.44	
Ypsilanti (1)	45.5		94	Aug	1	Mar	36.44	
Ypsilanti (2)	47.5		94	Aug	5	Mar	32.36	
<i>Minnesota.</i>								
Alexandria							22.18	
Crookston	38.3		100	July	-36	Jan	15.87	
Fergus Falls							20.16	
Fort Ripley							24.27	
Fort Snelling	42.7		98	July	-22	Jan	28.86	
L. Winnibigoshish	37.7		94	June	-30	Jan	24.29	
Leech Lake	37.6		94	June	-35	Jan	26.04	
Le Sueur	44.3		97	July	-24	Jan	26.21	
Mankato	45.1		94	July	-16	Jan	23.33	
Minneapolis	42.5	+ 0.8	95	July	-21	Jan	27.07	- 3.41
Montevideo	42.5		94	Aug	-26	Jan	21.45	
Morris	41.1		97	Aug	-27	Jan	17.74	
Northfield	43.2		94	July	-25	Jan	28.99	
Ortonville							17.07	
Pine River	37.6		94	June	-36	Jan	19.68	
Pokeyama Falls	36.9		94	June	-40	Mar	26.63	
Red Wing			93	July	-21	Jan		
Redwood Falls							10.77	
Rolling Green	42.6		93	July	-20	Jan	26.61	
Saint Charles	41.3		94	July	-20	Mar	34.41	
Sheldon	43.4				-25	Jan	30.11	
Tracy							16.76	
<i>Mississippi.</i>								
Agricultural College	64.9		96	July	19	Mar	55.05	
Batesville	63.6		98	July	19	Mar	51.23	
Booneville			100	July	14	Mar		
Brookhaven	67.8		99	July	20	Dec	58.69	
Canton			95	June	23	Mar	48.95	
Columbus (2)			106	July	18	Mar		
Edwards	67.4		101	July	21	Mar	54.75	
Fayette			97	July	22	Jan	59.31	
Greenville			98	July	21	Mar		
Holly Springs	63.4		96	July	18	Mar	71.36	
Kosciusko	64.7		97	July	20	Mar	46.83	
Lake			97	July	15	Mar		
Logtown	69.1		94	June	24	Mar	51.10	
Louisville	65.6		103	July	15	Mar	62.11	
Moss Point	70.1		98	June	25	Mar	55.17	
Palo Alto	64.5		96	July	20	Mar	64.52	
Pearlington	69.5		93	July	30	Mar	50.73	
Port Gibson			99	July	20	Mar		
Pontotoc	62.1		95	July	18	Mar	66.16	
Rienzi			101	June	18	Mar		
Vaiden			104	July	19	Mar		
Washington	68.0		98	July	23	Mar	58.75	
Water Valley	65.7		104	June	19	Mar	58.49	
Waynesborough (1)	66.0		95	July	20	Mar	50.56	
Yazoo City							53.43	
<i>Missouri.</i>								
Boonville			102	July	-4	Feb	32.75	
Brunswick	53.8		102	July	-19	Jan	37.05	
Conception	51.7		100	July	-6	Jan	37.57	
Excelsior Springs	51.3		103	July	-3	Jan	26.64	
Fayette	54.5		104	July	-3	Jan	29.97	
Glasgow	54.0		103	July	-3	Jan	31.21	
Grand Pass	53.6		102	July	-3	Jan	29.10	
Harrisonville	51.5		99	July	-1	Feb	31.31	
Hermann			101	July	1	Mar	35.32	
Jefferson Barracks	57.1		104	July	-6	Jan	36.88	
Kansas City (1)	55.0		104	July	-6	Jan	34.65	
Kansas City (2)	54.0		94	June	2	Feb		
Lebanon	58.4						33.39	
Louisiana Bridge			103	July	2	Feb		
New Haven	55.9		103	July	2	Feb		
Oak Ridge	59.0		103	June	7	Mar	51.58	
Oregon	52.4		103	July	-15	Jan	25.34	
Princeton	53.2		100	July	-11	Mar	39.51	
Saint Charles (1)			103	July	-11	Mar	32.90	
Saint Joseph							32.41	
Sedalia	55.7		102	July	-4	Feb	32.02	
Shelbina							28.10	
Willow Springs	57.8		105	June	2	Feb	54.86	
Wilder's Mills			103	July	0	Feb	25.77	
Warrensburg	54.0		105	July	-3	Jan	30.95	
<i>Montana.</i>								
Camp Poplar River	39.7		99	July	-46	Feb	11.20	
Fort Assiniboine	40.9		99	July	-40	Feb	10.37	
Fort Custer	45.2		100	July	-34	Feb	10.09	
Fort Keogh	42.3		105	July	-47	Feb	11.52	
Fort Missoula	43.1		104	July	-18	Jan	13.39	
Fort Shaw	45.0	- 0.2	101	Aug	-39	Feb	12.31	+ 2.00
Glendive	44.9		106	Aug	-44	Feb	10.13	
Martinsdale			102	July	-42	Feb		
Powder River	43.7		107	July	-41	Feb	12.39	
Virginia City	45.4		93	July	-27	Jan	9.77	
<i>Nebraska.</i>								
Ansel	49.0		109	July	-26	Feb	19.75	
Ashland			104	July	-20	Jan		

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Nebraska—Continued.</i>	°	°	°		°		Inches.	Inches.
Creighton	105		July	—27	Jan		21.95	
Crete	103		July	—18	Jan		14.16	
Culbertson			July	—24	Feb		17.94	
David City	103		July	—10	Jan		24.56	
De Soto	49.1		103	July	—12	Jan	22.93	
Fairbury	104		July	—12	Jan		14.79	
Fort Niobrara	106		July	—34	Jan		22.45	
Fort Omaha	43.8		101	July	—12	Jan	11.76	
Fort Robinson	51.1		102	July	—23	Jan	23.36	
Fort Sidney			103	July	—13	Jan	22.31	
Fremont	49.2		103	July	—24	Feb	15.95	
Genoa	48.9		102	June	—21	Feb	29.41	
Hay Springs	45.2		102	July	—19	Jan	17.87	
Howe	52.9		106	July	—16	Jan	12.17	
Kennedy			106	July	—18	Feb	14.41	
Kimball	49.1		103	July	—15	Feb	11.84	
Lexington	103		July	—16	Jan		23.99	
Lincoln	50.7		103	July	—17	Jan	19.31	
Marquette (1)			108	July	—20	Feb	17.49	
Minden			106	July	—10	Jan	11.35	
Nebraska City	50.9		105	Aug	—28	Feb	19.15	
North Loup	48.7		103	July	—29	Jan	20.11	
Oakdale	47.0		103	July	—24	Feb	27.02	
Palmer	46.8		103	July	—22	Feb	20.05	
Ravenna	48.4		106	July	—14	Jan	29.15	
Syracuse	51.5		100	July	—18	Jan		
Tecumseh	50.9		107	July	—23	Feb		
Weeping Water	48.1		107	July	—23	Feb		
West Hill	47.6		193	July	—24	Jan		
West Point			95	July	—23	Jan		
<i>Nevada.</i>								
Austin	47.0		93	July	—12	Feb	14.95	
Battle Mountain			102	July	—18	Jan		
Belmont			93	July	—9	Feb		
Beowawe (1)	50.3		101	July	—32	Jan	11.82	
Browns	57.3		104	July	—18	Jan	6.37	
Candelaria	50.4		96	July	—4	Jan	5.49	
Carlin	44.8		110	July	—30	Jan	9.20	
Carson City	48.3		97	July	—27	Jan	13.80	
Crane's Ranch				July	—18	Jan	12.09	
Downeyville	52.4		102	July	—18	Jan	10.31	
El Dorado Canyon	72.0		118	July	—30	Jan	6.04	
Fenelon			105	Aug	—37	Jan		
Genoa			93	July	—24	Jan		
Golconda	50.8		100	July	—17	Jan	6.38	
Halleck	45.2		100	July	—32	Feb	6.21	
Hawthorne (1)			99	July	—6	Jan		
Hot Springs (1)	49.3		103	July	—20	Jan	11.85	
Humboldt	48.4		99	July	—20	Jan	23.59	
Lewer's Ranch	49.2		95	July	—14	Jan	12.00	
Palisade	48.1		102	July	—25	Jan	16.14	
Pioche			100	July	—12	Feb	6.35	
Reno	50.0		107	July	—15	Jan	6.04	
Tecoma	48.5		99	July	—23	Jan	6.00	
Verdi	49.2		100	July	—25	Jan		
Wells								
<i>New Hampshire.</i>								
Antrim	43.1		93	Aug	—31	Dec	45.36	
Berlin Falls	39.0		93	Aug	—30	Dec	51.34	
Berlin Mills	45.2		91	July	—11	Dec	47.61	
Concord	43.5		89	July	—11	Dec	49.69	
East Canterbury	42.9	+ 0.2	91	July	—20	Dec	44.80	+ 8.27
Hanover (1)	42.9		94	July	—26	Dec	43.25	
Hanover (2)							53.12	
Lake Village	46.4		92	July	—10	Dec	50.32	
Manchester (1)							54.21	
Mine Falls	46.4		95	July	—4	Feb	53.02	
Nashua	45.6		94	July	—5	Feb	47.35	
Newton	42.2		92	July	—16	Dec	43.86	
North Conway	42.1						53.14	
North Sutton			96	July	—16	Dec	51.07	
Pennichuck Station	41.8		93	July	—25	Dec	43.70	
Plymouth	42.8		90	July	—15	Dec	47.71	
Stratford	43.1		90	Aug	—32	Dec	48.49	
Walpole	39.1						53.14	
West Milan								
Wier's Bridge								
<i>New Jersey.</i>								
Allaire	51.6		93	July	8	Mar	51.03	
Asbury Park	53.2		92	July	9	Mar	57.46	
Belleville							48.08	
Beverly	52.4		100	July	8	Mar	47.76	
Billingsport L. H.	55.0		99	July	11	Mar		
Bridgeton	56.9		96	July	14	Mar	55.38	
Cape May C. H.	55.0		96	July	10	Mar	39.51	
Egg Harbor City	53.2		97	July	8	Mar	43.64	
Freehold	52.3		94	July	3	Mar	54.78	
Gillette	51.0		95	July	6	Mar	54.07	
Highland Park	51.6		94	July	5	Mar	46.02	
Imlaytown	52.6		97	July	6	Mar	47.26	
Junction							46.93	
Lambertville	52.5		94	July	8	Mar	50.73	
Locktown	52.0		98	July	5	Mar	43.23	+ 0.73
Madison	52.8	+ 1.7	97	July	9	Mar	50.86	
Moorestown	52.6		94	July	4	Mar	55.90	
Newark (1)							56.24	
Newark (2)							55.36	
New Brunswick (1)	52.0		98	July	7	Dec	56.24	
New Brunswick (2)	52.0		93	July	6	Mar	55.36	
New Brunswick (3)	54.9		94	July	6	Mar		
Ocean City			90	June	12	Mar	61.79	
Oceanic								

Annual summary for 1890—Voluntary stations—Continued.

State and station	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>New Jersey—Continued.</i>	°	°	°		°		<i>Inches.</i>	<i>Inches.</i>
Rancocas			97	July	8	Mar	45.03	
Readington	55.1		96	July	98	Mar		
South Orange	50.7	+ 0.2	94	July	6	Mar	53.39	+ 5.79
Tenafly	50.4		97	July	0	Mar	53.79	
Trenton	56.7		97	July	7	Mar	50.80	
Woodbury	55.6		101	July	13	Mar	47.17	
<i>New Mexico.</i>								
Chama	46.3		97	July	—17	Jan	20.61	
Embudo							11.59	
Estalina Springs							12.64	
Fort Bayard			94	July	9	Jan	15.86	
Fort Marcy	49.5		92	July	—4	Jan	13.11	
Fort Stanton	52.3		94	June	5	Mar	13.31	
Fort Union	46.0		95	Sept	—4	Mar	14.73	
Fort Wingate	51.6		98	July	—8	Feb		
Gallinas Spring	58.7		98	Sept	9	Feb	12.36	
Hillsborough	58.1		97	June	9	Feb	13.96	
Lordsburg	63.0		102	July	13	Feb	12.95	
Los Lunas			100	July	12	Dec		
Springer							10.71	
Taos							13.73	
<i>New York.</i>								
Alfred Centre	44.6		90	July	—6	Mar	49.13	
Ardenia	49.9		93	July	0	Dec	46.42	
Boyd's Corner's	50.6		97	July	1	Mar	54.36	
Brookfield	43.6		92	July	—15	Dec	58.63	
Canton	42.5		96	Aug	—16	Dec	41.77	
Central Park, N. Y.	52.6		98	July	7	Mar	45.63	
Cooperstown	44.3	+ 0.5	88	July	—15	Mar	58.11	+ 20.56
David's Island	50.3		93	July	4	Mar	46.69	
Factoryville			94	July	—15	Dec		
Fleming	45.9		96	July	3	Dec	47.42	
Fort Columbus	52.8		91	July	8	Mar	51.32	
Fort Hamilton	52.3		91	July	7	Mar	44.84	
Fort Niagara	49.4		97	Aug	7	Mar	34.62	
Fort Wadsworth	53.1		97	July	7	Mar	53.92	
Geneva	47.6		99	Aug	0	Dec	44.21	
Hess Road Station			97	Aug	—2	Jan		
Honeyman Brook	46.8		92	July	—7	Dec	48.09	
Ithaca	48.0		96	July	—3	Mar	46.39	
Keene Valley	39.4		96	July	—17	Dec	41.24	
Lyons	47.4		94	Aug	5	Dec	45.66	
Madison Barracks			100	Aug	—19	Feb	32.14	
Marshall	46.1		100	Aug	—9	Mar	43.13	
Ogdensburg	42.0		93	Aug	—10	Jan		
Oxford			89	July	—14	Mar		
Palermo	45.1	+ 1.0	94	Aug	—6	Dec	42.37	+ 5.23
Palmyra	49.0		97	Aug	4	Dec		
Pendleton Centre			93	Aug	0	Mar	47.78	
Perry City	44.9		97	July	—8	Mar	53.07	
Plattsburgh			92	July	—12	Jan		
Plattsburgh Barracks							37.39	
Port Jervis			92	July	—1	Mar		
Potsdam			93	Aug	—14	Jan		
Quaker Street	42.9		90	July	—7	Mar	46.91	
Rome	44.8		93	July	—14	Mar	66.82	
Setauket	51.2		91	July	8	Mar	53.94	
South Canisteo	44.8		93	July	—7	Dec	63.63	
S. E. Reservoir							55.20	
Turin	41.5		91	Aug	—13	Mar	64.27	
Utica			95	Aug	—10	Mar		
Watervliet Arsenal			97	July	—8	Mar	44.90	
Wedgwood			98	July	—1	Dec		
West Point	47.3		98	July	—1	Mar	50.16	
White Plains								
Willels Point	52.2		92	July	—2	Jan		
<i>North Carolina.</i>								
Asheville (2)	56.5		90	June	11	Mar	41.65	
Bryson City							55.72	
Douglas			101	June	13	Mar		
Franklin			93	June	10	Dec		
Highlands			84	June	4	Mar		
Lenoir	57.6	+ 2.3	90	June	15	Dec	52.20	+ 0.28
Mount Airy	57.4		95	June	14	Dec	52.53	
Mount Pleasant	60.2		98	June	18	Mar		
Murphy							67.37	
Pittsborough	59.5		95	June	18	Mar	38.21	
Salisbury	62.7		95	June	24	Mar	48.90	
Soapstone Mount	56.5					18	Dec	
Weldon	60.6		99	June	20	Mar	45.63	
Wilmington			95	July	17	Mar	46.91	
<i>North Dakota.</i>								
Fort Abraham Lincoln ..	41.4		105	Aug	—34	Feb	18.11	
Fort Buford	41.0		100	July	—43	Feb	14.23	
Fort Pembina	38.3		97	June	—46	Feb		
Fort Yates	43.5		102	July	—30	Jan	15.60	
Gallatin	35.4		102	July	—42	Feb	14.85	
Napoleon			101	Aug	—31	Feb		
New England City	39.2		102	July	—45	Feb	16.08	
Steele	40.0		108	July	—41	Feb		
Wahpeton	43.1		99	July	—31	Jan		
<i>Ohio.</i>								
Akron	50.2		95	Aug	4	Mar	53.09	
Ashland	51.4		93	July	4	Mar	49.07	
Athens	57.7		95	Aug	—1	Mar	52.08	
Bangorville	49.6		94	July	3	Mar	52.41	
Bellevue			96	Aug	4	Mar	46.57	
Bement	49.2		96	July	3	Mar	44.75	
Caledonia							52.59	
Canton	50.7		96	July	0	Mar	52.32	
Celina	53.4		96	Aug	5	Mar	41.67	
Circleville (1)							43.64	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
Ohio—Continued.	°	°	°		°		Inches.	Inches.
Clarksville	53.1		98	Aug.	3	Mar.	46.92	
Cleveland	56.8		95	July	6	Mar.	48.99	
Columbus Barracks	53.3		97	July	4	Mar.	51.25	
Dayton	54.8		99	July	3	Mar.	42.57	
Demos	51.5		92	Aug.	0	Mar.	66.80	
Elyria	50.9		98	July	3	Mar.	51.06	
Findlay	50.6		97	Aug.	2	Mar.	42.75	
Garrettsville	47.4		93	Aug.	-11	Mar.	52.88	
Georgetown	54.5		98	July	2	Mar.	56.90	
Gratiot	52.6		94	July	5	Mar.	57.84	
Greenville	51.8		92	Aug.	4	Mar.	41.32	
Hanging Rock	54.3		96	July	3	Mar.	60.22	
Hassan			93	July	2	Jan.		
Hiram	48.2		92	Aug.	0	Mar.	51.33	
Jacksonborough	54.1		99	Aug.	2	Mar.	40.50	
Jefferson			94	Aug.	-4	Mar.		
Kenton	51.6		98	Aug.	6	Mar.	30.59	
Mansfield							53.02	
Marietta (2)	54.6		92	Aug.	-2	Mar.	60.99	
McConnellsville			95	Aug.	-1	Mar.		
Napoleon	52.5		101	Aug.	6	Jan.	45.52	
New Alexandria	52.0		93	Aug.	-1	Mar.	58.53	
New Comerstown	50.7		94	July	-2	Mar.	62.79	
North Lewisburgh	53.9	+ 3.5	103	Aug.	2	Mar.	45.25	+ 6.05
Oberlin	50.0		93	July	0	Mar.	45.91	
Ohio State University	52.3		95	July	4	Mar.	50.47	
Orangeville	48.4		95	Aug.	-14	Mar.	46.35	
Portsmouth (2)	56.0		98	June	10	Mar.	57.59	
Shiloh	50.1		96	Aug.	5	Mar.	42.80	
Springborough							45.82	
Tiffin	50.6		100	July	5	Mar.	45.57	
Upper Sandusky	51.8		96	July	4	Mar.	48.03	
Vienna	49.0		97	Aug.	-10	Mar.	48.50	
Wauseon	49.4	+ 3.0	100	Aug.	0	Mar.	39.29	+ 2.98
Waverly	50.3		96	July	10	Mar.	53.58	
Waynesville			95	Aug.	3	Mar.	46.70	
Westerville			95	July	5	Mar.	49.70	
West Milton	56.1		103	July	4	Mar.	54.44	
Weymouth			98	Aug.	-4	Mar.	52.59	
Wooster	49.5		94	July	1	Mar.	53.94	
Youngstown	51.4		94	July	-2	Mar.	50.93	
Zanesville							57.44	
Oregon								
Albany	53.1	- 0.6	108	Aug.	10	Jan.	40.02	- 3.87
Ashland (1)	50.6		93	June	10	Jan.	19.04	
Ashland (2)	51.2		99	June	5	Jan.	20.26	
Bandon	51.4		74	July	22	Jan.	58.78	
Beulah	44.1		98	July	-19	Jan.	9.71	
Cascade Locks							70.96	
Corvallis			98	Aug.	7	Jan.	34.82	
East Portland			94	July	4	Feb.	30.88	
Ellensburg	51.5		83	June			83.50	
Eola	49.9	- 1.2	95	Aug.	4	Jan.	31.92	- 7.40
Gardiner	51.8		82	May	30	Jan.	63.28	
Heppner	49.7		101	July	-17	Feb.	12.39	
Hood River	51.6		98	Aug.	-6	Jan.	25.03	
Hubbard			96	Aug.	0	Jan.		
Jacksonville	51.1		96	June	13	Jan.	27.72	
La Grande	48.8		99	July	-19	Feb.	16.54	
McMinnville	50.0		100	Aug.	3	Jan.	41.85	
Mount Angel	51.9		97	Aug.	-1	Jan.	33.62	
North Powder			99	July	-26	Feb.		
Pendleton	49.7		105	July	-16	Jan.	10.74	
Siskiyou	49.8		90	July	9	Feb.	36.72	
Telocasset							14.03	
The Dalles			98	July	-12	Jan.		
Vernonia			97	Aug.	4	Jan.		
Pennsylvania								
Allegheny Arsenal			98	Aug.	-2	Mar.	53.03	
Altoona	54.5		97	July	3	Mar.	41.99	
Aqueduct	53.0		99	July	7	Mar.	50.74	
Blooming Grove	49.0		98	July	0	Dec.	64.10	
Blue Knob	47.5		94	Aug.	-7	Mar.	46.68	
Brookville							44.29	
Carlisle	52.2		101	July	6	Mar.	50.12	
Catawissa			96	July	10	Dec.		
Charlestown	50.2		97	July	-18	Mar.	39.03	
Clarion (1)							63.12	
Conestoga	51.7		99	July	6	Mar.	50.97	
Confluence							60.19	
Coopersburgh	51.2		96	July	5	Mar.	57.58	
Corry	47.1		95	Aug.	-16	Mar.	65.66	
Doylstown							48.51	
Dyberry	44.7	+ 0.9	90	July	-11	Dec.	53.37	+ 16.51
Eagle's Mere	45.1		88	July	-4	Dec.	71.00	
Easton							51.55	
Edinborough	46.6		90	Aug.	-6	Mar.	63.26	
Emporium	51.1		94	July	-13	Mar.	63.26	
Forks of Nesaminy	52.3						48.56	
Frankford Arsenal	54.2		99	July	7	Mar.	33.88	
Frederick							50.21	
Freeport							57.93	
Girardville	49.9		92	July	5	Mar.	64.03	
Grampian Hills	48.2	+ 2.4	98	July	-14	Mar.	55.01	+ 11.11
Greensborough							65.15	
Greenville			96	Aug.	-8	Mar.		
Hollidaysburg	51.1		98	July	-16	Mar.	50.69	
Honesdale	47.0		89	July	-9	Dec.	50.29	
Huntingdon	51.0		98	July	-3	Mar.	49.52	
Johnstown			94	Aug.	-4	Mar.	56.60	
Kennett Square	50.5						51.36	
Lansdale							42.99	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
Pennsylvania—Continued.	°	°	°		°		Inches.	Inches.
Le Roy	48.4		93	July	0	Dec.	49.84	
Lewisburgh	51.6		100	July	2	Mar.	44.97	
Lock Haven			97	July	-12	Mar.	49.48	
Lock No. 4							62.75	
Mahoning							38.47	
Mauch Chunk	49.9		95	July	4	Dec.	58.33	
McConnellisburgh	52.2		97	July	-3	Mar.	51.80	
Myerstown	50.9		98	July	1	Dec.	50.17	
New Castle	53.0		98	Aug.	2	Dec.	52.53	
Nisbet	49.7				-2	Mar.	49.25	
Oil City							45.16	
Ottsville							52.34	
Parker's Landing							57.29	
Petersburgh	50.7		102	Sept.	-6	Mar.	46.54	
Philipsburgh	49.1		94	July	-21	Mar.	46.35	
Point Pleasant							48.27	
Pottstown	53.4		99	July	5	Mar.	50.12	
Quakertown	50.1		96	July	4	Mar.	57.46	
Rimersburgh			94	July	-8	Mar.		
Salem Corners	48.5		92	July	0	Mar.	57.90	
Saltsburgh							58.28	
Seisholtzville							50.96	
Smith's Corners							49.18	
Somerset	49.4		93	Aug.	-17	Mar.	66.26	
South Eaton	48.2		92	July	-3	Dec.	42.81	
State College	49.2		94	July	-6	Mar.	43.88	
Swarthmore			96	July	8	Mar.		
Tipton			110	July	-14	Mar.		
Troy			98	July	-13	Dec.	43.56	
Tuscarora	54.3		101	July	2	Mar.	47.36	
Uniontown	54.9		95	Aug.	-10	Mar.	70.68	
Warren							58.22	
Wellsborough	45.8	- 0.8	94	July	-10	Dec.	51.76	- 9.14
West Chester	52.8		96	July	5	Mar.	54.43	
Wilkes Barre			98	July	-9	Dec.	48.12	
Wyox			97	July	-9	Dec.		
York	52.8		101	July	4	Mar.	44.67	
Rhode Island								
Bristol	49.3		88	July	5	Dec.	50.80	
Fort Adams	48.8		93	July	4	Dec.	38.07	
Kingston (1)	48.7		92	July	1	Dec.	55.15	
Kingston (2)	48.4		91	July	3	Dec.	57.57	
Lonsdale							52.60	
Olneyville	51.2		93	July	5	Mar.		
Pawtucket							49.04	
Providence (1)			96	July	6	Dec.	49.61	
Providence (2)	49.3		95	July	2	Dec.	46.06	
South Carolina								
Belmont	62.8		97	June	19	Mar.	45.13	
Cheraw	64.8		103	June	19	Dec.	34.69	
Conway			97	June	24	Dec.		
Evergreen			97	June	18	Mar.	52.21	
Greenville							52.21	
Greenwood			102	June	20	Mar.		
Hardeeville			96	Aug.	24	Mar.		
Jacksonborough			100	June			38.27	
Kirkwood	59.9						37.53	
Port Royal	67.5		97	June	27	Mar.	41.59	
Simpsonville			102	June	18	Mar.		
Spartanburgh (1)	61.6		99	June	11	Mar.	49.01	
Spartanburgh (2)	62.8		96	July	20	Mar.	48.25	
Statesburgh	63.6	+ 1.3	95	June	22	Mar.	42.96	+ 2.64
Trial			99	June	22	Mar.	45.05	
Walhalla			89	July	20	Dec.		
Winnabow			98	July	18	Mar.		
Yorkville	62.7		97	June	16	Mar.	47.33	
South Dakota								
Alexandria	45.0		103	July	-25	Feb.		
Brookings	41.2		99	Aug.	-35	Feb.		
Canton	46.4		101	July	-24	Jan.	21.42	
Clark	42.2		105	July	-26	Jan.		
De Smet	40.5		85	July	-25	Jan.	15.86	
Flandreau			98	Aug.	-26	Feb.	20.53	
Fort Bennett	46.6		107	July	-28	Feb.	13.59	
Fort Meade	46.4		101	July	-29	Feb.	16.23	
Fort Randall	48.5		104	July	-24	Jan.	14.04	
Fort Sully	48.1		106	July	-31	Feb.	12.79	
Kimball	42.3		105	July	-27	Feb.	14.08	
Onida			104	July	-28	Feb.		
Seranton			102	Aug.	-33	Feb.	17.59	
Spearfish	48.0		105	July	-23	Feb.	20.73	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature—degrees Fahrenheit.						Precipitation in inches.	
	Mean an- nual.	Departure from nor- mal.	Extremes for 1890.				Total for 1890.	Departure from nor- mal.
			Max.	Month.	Min.	Month.		
Tennessee—Continued.								
Johnsonville	°	°	°		°		Inches.	Inches.
Kingston (1)							49.51	59.72
Kingston Springs			96	July	17	Mar		
Lewisburgh	60.0		95	June	19	Mar	53.02	
Lynnville			98	July	10	Mar		
McKenzie			93	June	18	Mar		
Nunnally	60.6		95	June	15	Mar	52.43	
Parkville	60.7		95	July	18	Mar	53.65	
Riddletown	59.8		98	June	16	Mar	67.12	
Rockwood							53.03	
Rogersville	57.5		94	July	19	Mar	47.03	
Rugby	56.7		93	July	13	Mar	63.88	
Sharps			98	June	18	Mar		
Springdale	59.7		97	July	17	Dec	58.33	
Strawberry Plains							44.44	
Trenton	58.8		94	July	10	Mar	63.99	
Watkins			102	June	16	Mar		
Waynesborough	59.6		97	June	20	Mar	51.84	
Texas.								
Austin (1)	69.6		101	July	22	Feb	36.42	
Austin (2)	69.5		100	July	22	Feb		
Brady	65.6				11		26.96	
Brasoria	69.0		98		24		55.90	
Brenham	70.0		99		23		43.69	
Brownwood	65.8		102		7		28.81	
Camp Eagle Pass	71.8		107	July	17	Jan	21.09	
Camp Peña Colorado	62.5		103	June	11	Jan		
Childress			104	July	5	Feb	40.44	
College Station	69.4		99	July	20	Feb	40.44	
Columbia	70.6		98	July	24	Mar	66.11	
Corsicana (1)	68.9		100		19		43.22	
Dallas (2)	67.1		106		11		37.02	
Duval			107	July	21	Feb		
Epworth	62.4		101	July	10	Feb	18.95	
Forestburg	63.0				14	Feb	40.74	
Fort Bliss	65.0		103	July	15	Jan		
Fort Brown			96	July	29	Mar		
Fort Clark			100	July	24	Mar	21.66	
Fort Hancock	62.1		107	June	7	Feb	4.89	
Fort McIntosh	72.2		102	July	23	Mar	15.74	
Fort Ringgold	74.2		107	July	20	Mar	13.43	
Fredericksburgh	64.9		101	July	20	Feb	31.84	
Gallinas	68.1		104	July	16	Mar	28.93	
Graham	64.2		105	July	11	Jan	29.37	
La Grange	68.9				26	Dec	47.09	
Lampasas	66.9		102	July	17	Feb	28.07	
Longview	68.1		102	July	19	Mar	60.92	
Menardville	64.0		96		12		21.39	
Mesquite	66.4		106		16		42.60	
New Ulm	59.7	+ 1.5	101	July	21	Mar	41.55	-10.30
Panhandle			99	July	— 2	Feb		
Panther	66.2		110	July	14	Feb	30.30	
Round Rock	64.8		103		20		26.06	
San Antonio	69.9		100	July	21	Mar		
Silver Falls	62.5		101	July	9	Feb	19.79	
Tyler	67.0		102		16		24.77	
Waco (2)	68.3		103	July	18	Feb	41.85	
Utah.								
Beaver	48.0		97	July	—18	Feb	6.06	
Blue Creek	54.1		105	July	— 6	Jan	9.64	
Corinne	51.8		102	July	—12	Jan	11.35	
Fort Douglas	51.9		100	July	— 6	Feb	11.24	
Fort Duchesne	46.9		100	July	—23	Jan	5.50	
Kelton	51.1		105	July	—22	Jan	6.73	
Losee	47.4		96	Aug	—10	Feb	13.70	
Moab	54.8		108	July	— 4	Jan	5.58	
Mount Carmel	45.6				—12	Jan	12.31	
Mount Pleasant					—20	Feb	12.37	
Nephi	47.5		99	July	—23	Jan	8.54	
Ogden (1)	49.0		94	July	—16	Feb	18.61	
Ogden (2)	54.5		99	July	—11	Feb	15.92	
Price							9.50	
Promontory	48.8		104	July	—16	Jan	4.70	
Saint George	61.6		112	July	—13	Feb	9.67	
Terrace	52.4		104	July	—15	Jan	3.10	
Vermont.								
Brattleborough (1)	46.3		95	July	—10	Dec	51.66	
Brattleborough (2)	46.4		93	July	— 4	Dec		
Burlington	46.4		91	July	—12	Jan		
Chelsea	41.3		83	Aug	—12	Dec	45.61	
Cornwall							37.92	
East Berkshire	40.6		92	Aug	—34	Dec	51.06	

Annual summary for 1890—Voluntary stations—Continued.

State and station.	Temperature.—degrees Fahrenheit.						Precipitation in inches.	
	Mean annual.	Departure from normal.	Extremes for 1890.				Total for 1890.	Departure from normal.
			Max.	Month.	Min.	Month.		
<i>Vermont—Continued.</i>	°	°	°		°		<i>Inches.</i>	<i>Inches.</i>
Hartland	43.9		92	July	—18	Dec	44.83	
Jacksonville	42.2		92	July	—16	Dec	59.07	
Lanesburgh	43.8		90	July	—16	Dec	45.13	
Strafford	43.1	— 1.3	88	July	—14	Dec	51.30	+11.
Vernon	46.6		98	July	—10	Dec	49.36	
Weathersfield Centre	42.5		89	Aug	—10	Dec		
<i>Virginia.</i>								
Abingdon							47.99	
Birdsneat	60.1	+ 1.8	97	July	20	Mar	49.22	+ 4.54
Bolar	48.3		87	Aug	0	Mar	38.02	
Christiansburg	54.9		95	July	10	Feb	33.50	
Dale Enterprise	55.0		96	July	2	Dec	35.39	
Fort Monroe	60.7		96	July	22	Mar	46.97	
Fort Myer	55.3		99	July	12	Mar	39.31	
Lexington	55.8		96	July	8	Dec	38.45	
Liberty	56.2		86	June	20	Mar	35.09	
Marion	55.0		94	July	12	Mar	45.46	
Mossing Ford	57.3				20	Dec	45.68	
Nottaway C. H.			102	June	13	Mar		
Petersburg	59.2		99	July	20	Dec	41.35	
Richmond	60.8		103	July	16	Mar	43.47	
Staunton			98	July	8	Dec		
Summit	53.6		94	July	8	Dec		
Woodstock							38.24	
<i>Washington.</i>								
Blakeley	50.3		86	July	10	Jan	31.30	
Doe Bay	45.3		76	Aug	16	Feb	23.03	
Fort Canby	51.2		89	Aug	18	Feb	49.16	
Fort Spokane	47.0		105	July	—22	Jan	13.86	
Fort Townsend	49.1	— 1.0	84	Aug	9	Feb	19.95	— 0.46
Fort Walla Walla	51.5		106	July	—13	Jan	11.01	
Tacoma							35.37	
Vancouver Barracks	50.7		99	Aug	3	Jan	37.97	
Waterville			101	July	—19	Feb		
<i>West Virginia.</i>								
Buckhannon							67.55	
Charleston							60.20	
Ella	52.0		88	July	2	Mar	62.61	
Glenville							68.64	
Harper's Ferry							36.60	
Hinton							31.99	
Kingwood			95	July	—10	Mar		
Morgantown							69.54	
Pleasant Hill	49.6		90	July	5	Mar		
Point Pleasant							63.08	
Rowlesburg							56.46	
Tannery	52.8		94	Aug	—14	Mar		
Tyler's Creek			98	June	6	Mar		
Weston							68.20	
Wheeling							64.28	
White Sulphur Springs							36.70	
<i>Wisconsin.</i>								
Butternut	36.7				—28	Jan	52.04	
Cadiz	45.6				—20	Mar		
Chippewa Falls							32.55	
Embarrass	43.9		94	July	—35	Mar	45.05	
Grantsburg			103	June	—23	Mar		
Greenwood	41.8		98	June	—35	Jan	38.21	
Honey Creek	47.2		98	June	—21	Mar		
Lincoln	45.2				—12	Jan	31.19	
Madison	46.0	+ 0.8	93	June	—14	Jan	36.67	+ 0.03
Manitowic	46.5		94	June	—19	Jan	32.86	
Medford (1)							37.84	
Neillsville	41.2		102	June	—36	Jan		
Oshkosh	45.3		95	June	—21	Jan	41.65	
Phillips							41.84	
Portage							39.63	
Summit Lake			102	June	—32	Jan		
<i>Wyoming.</i>								
Camp Pilot Butte	41.4		94	July	—28	Jan	7.30	
Camp Sheridan			91	July	—30	Feb	28.43	
Fort Bridger			92	Aug	—30	Jan		
Fort D. A. Russel l.	45.1		104	Aug	—31	Feb	17.99	
Fort McKinney	46.4		97	July	—22	Jan	8.98	
Fort Washakie	44.0		97	July	—25	Jan	8.36	
Lusk	44.8		97	July	—26	Feb	11.96	
Saratoga			99	July	—27	Jan		

Letters of the alphabet indicate number of days missing from the month's record; thus, e indicates five days missing.
* Normal appears to be too high.

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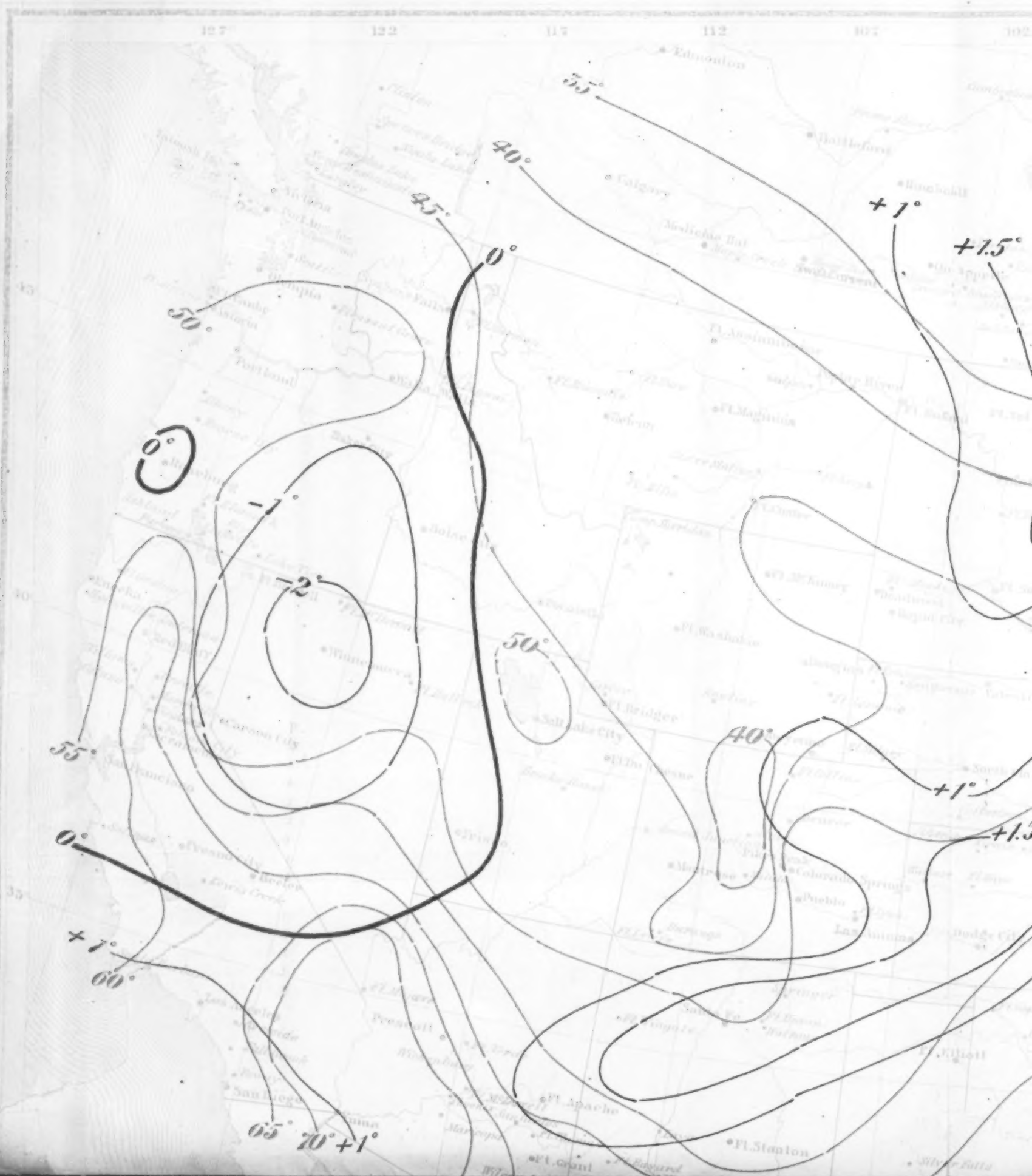
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WAR DEPARTMENT WEATHER MAP.

Brig. Gen. A. W. GREELY, Chief Signal Officer.

PUBLISHED BY AUTHORITY OF THE SECRETARY OF WAR.

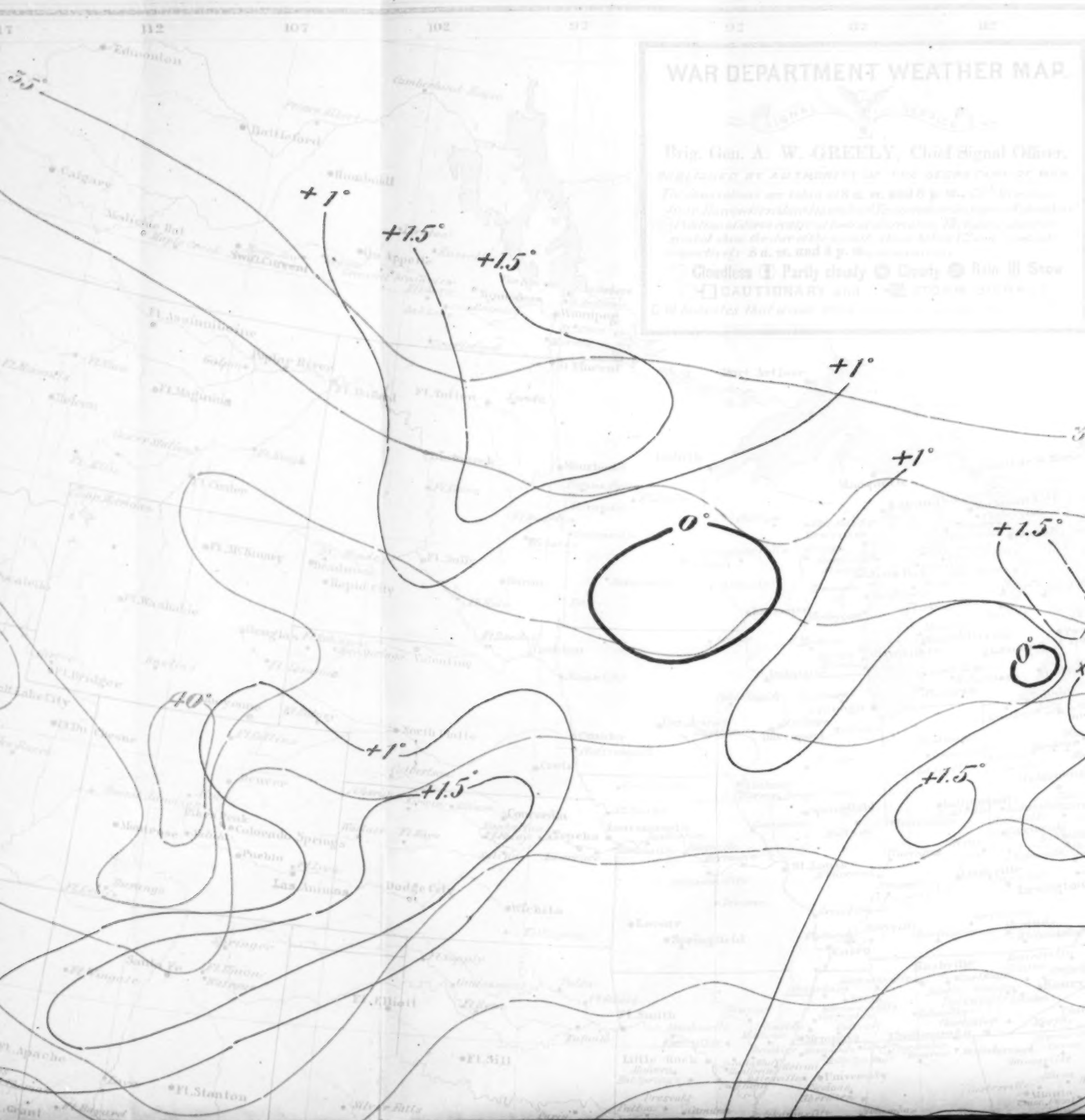
The observations upon which this map is based were taken at 3 a. m. and 3 p. m. at the principal stations of the Signal Service. The isotherms are drawn at intervals of 0.5° and 1°. The positions of the isotherms are shown at the principal stations of the Signal Service. The isotherms are drawn at intervals of 0.5° and 1°.

Cloudless ☐ Partly cloudy ☐ Cloudy ☐ Rain ☐ Snow ☐

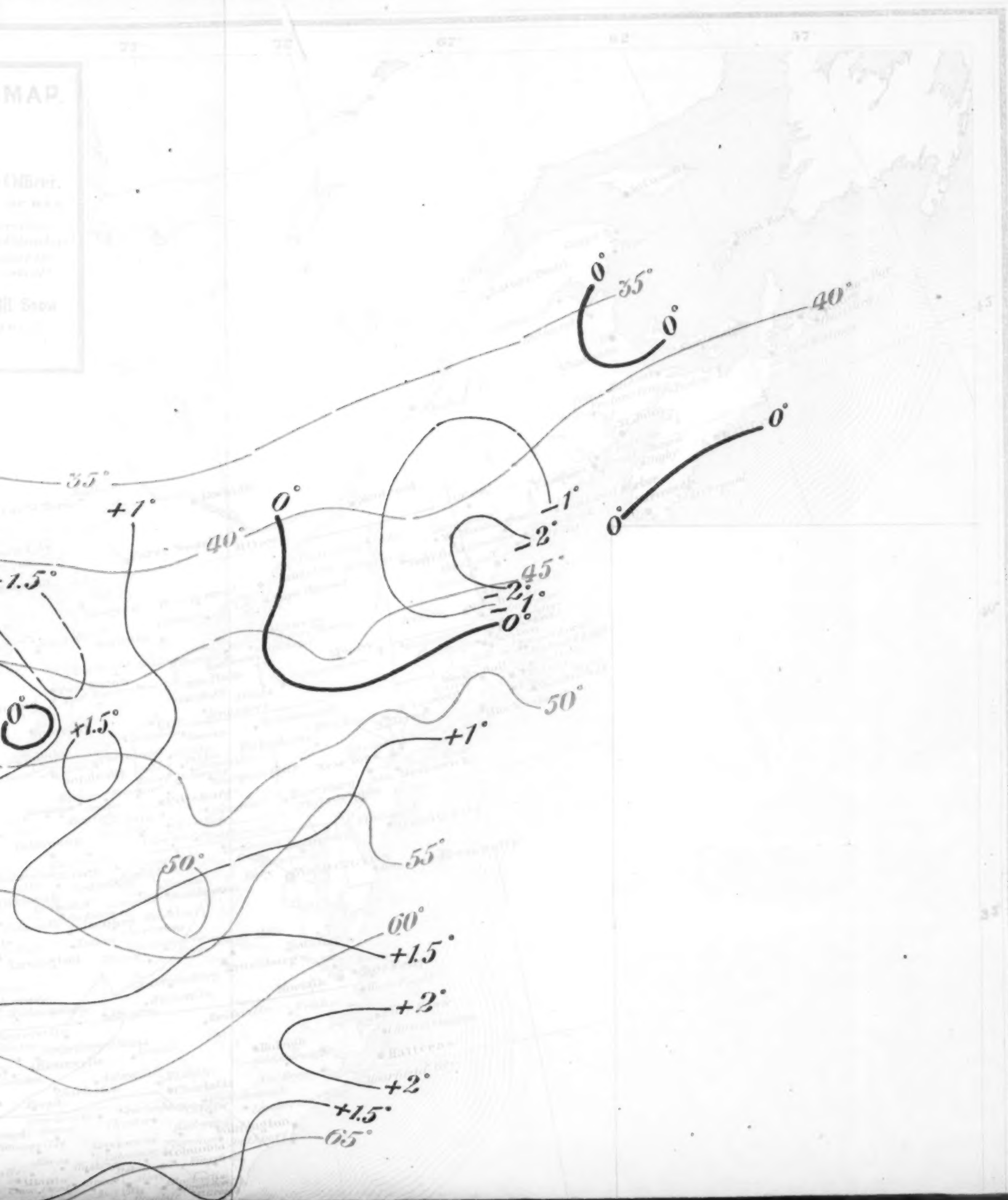
☐ CAUTIONARY and ☐ STORM SIGNALS

The isotherms are drawn at intervals of 0.5° and 1°.

CHART I. ANNUAL MEAN TEMPERATURE, 1890, AND DEPARTURES FROM



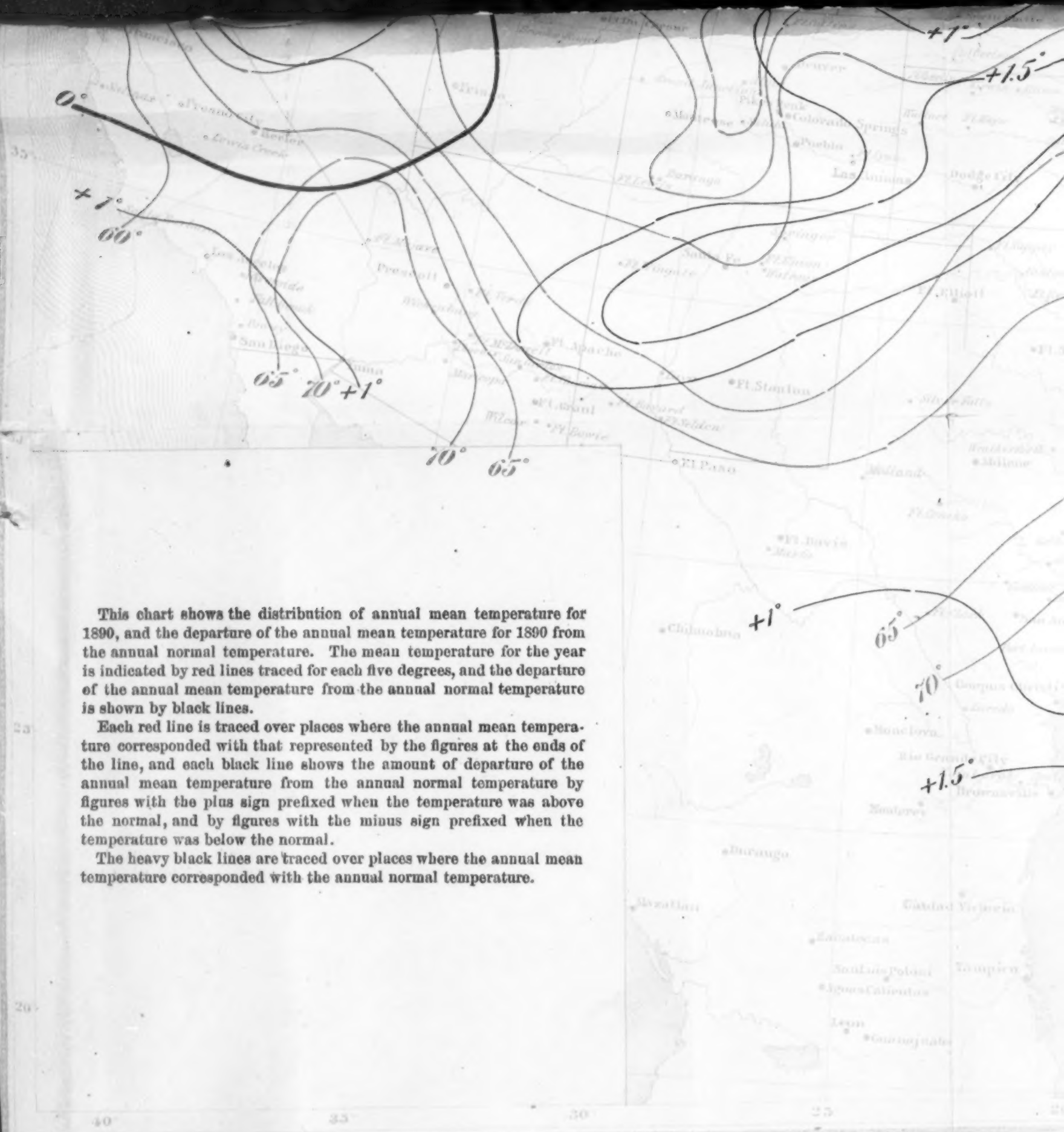
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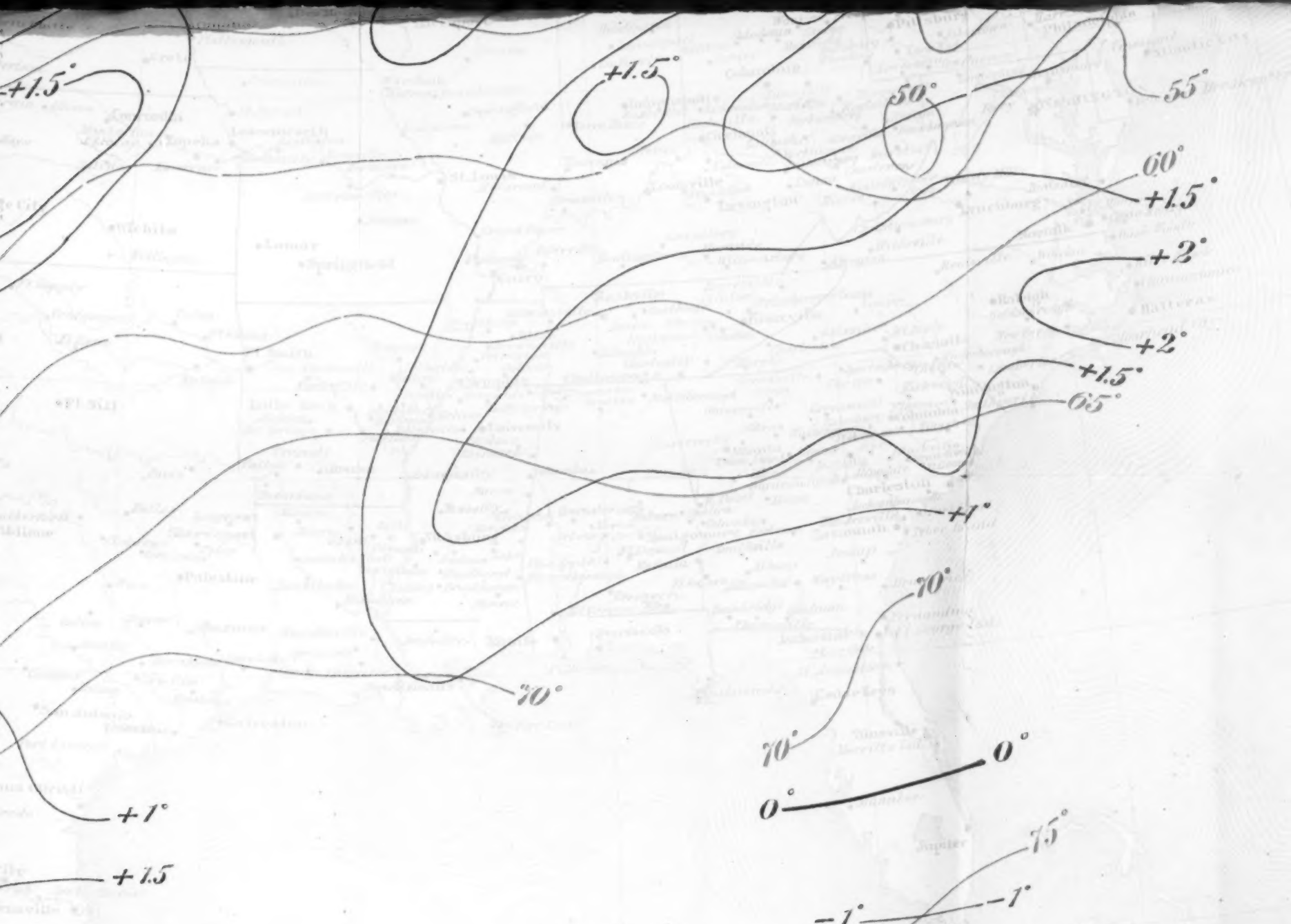


This chart shows the distribution of annual mean temperature for 1890, and the departure of the annual mean temperature for 1890 from the annual normal temperature. The mean temperature for the year is indicated by red lines traced for each five degrees, and the departure of the annual mean temperature from the annual normal temperature is shown by black lines.

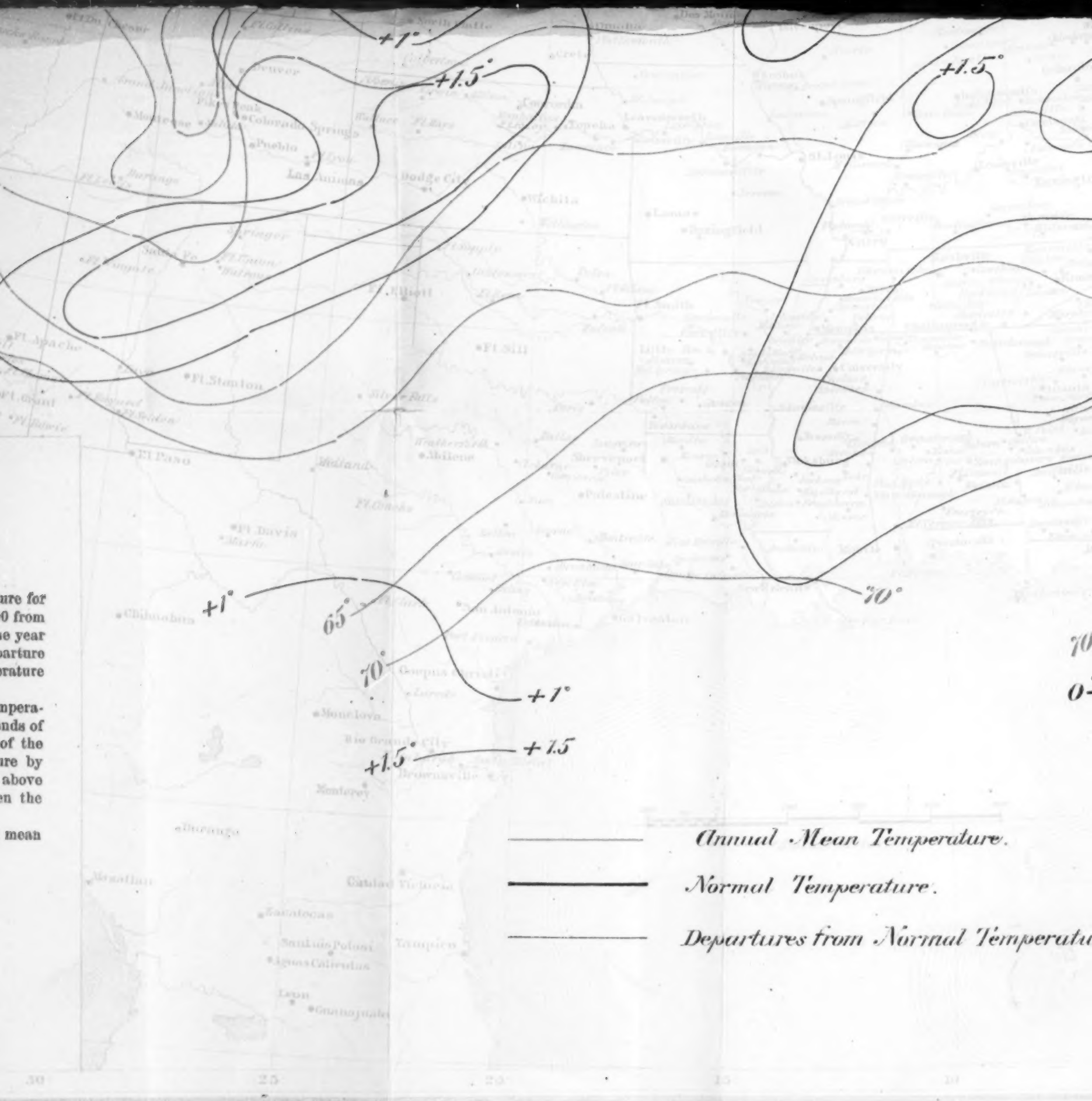
Each red line is traced over places where the annual mean temperature corresponded with that represented by the figures at the ends of the line, and each black line shows the amount of departure of the annual mean temperature from the annual normal temperature by figures with the plus sign prefixed when the temperature was above the normal, and by figures with the minus sign prefixed when the temperature was below the normal.

The heavy black lines are traced over places where the annual mean temperature corresponded with the annual normal temperature.





- *Annual Mean Temperature.*
- *Normal Temperature.*
- *Departures from Normal Temperature.*



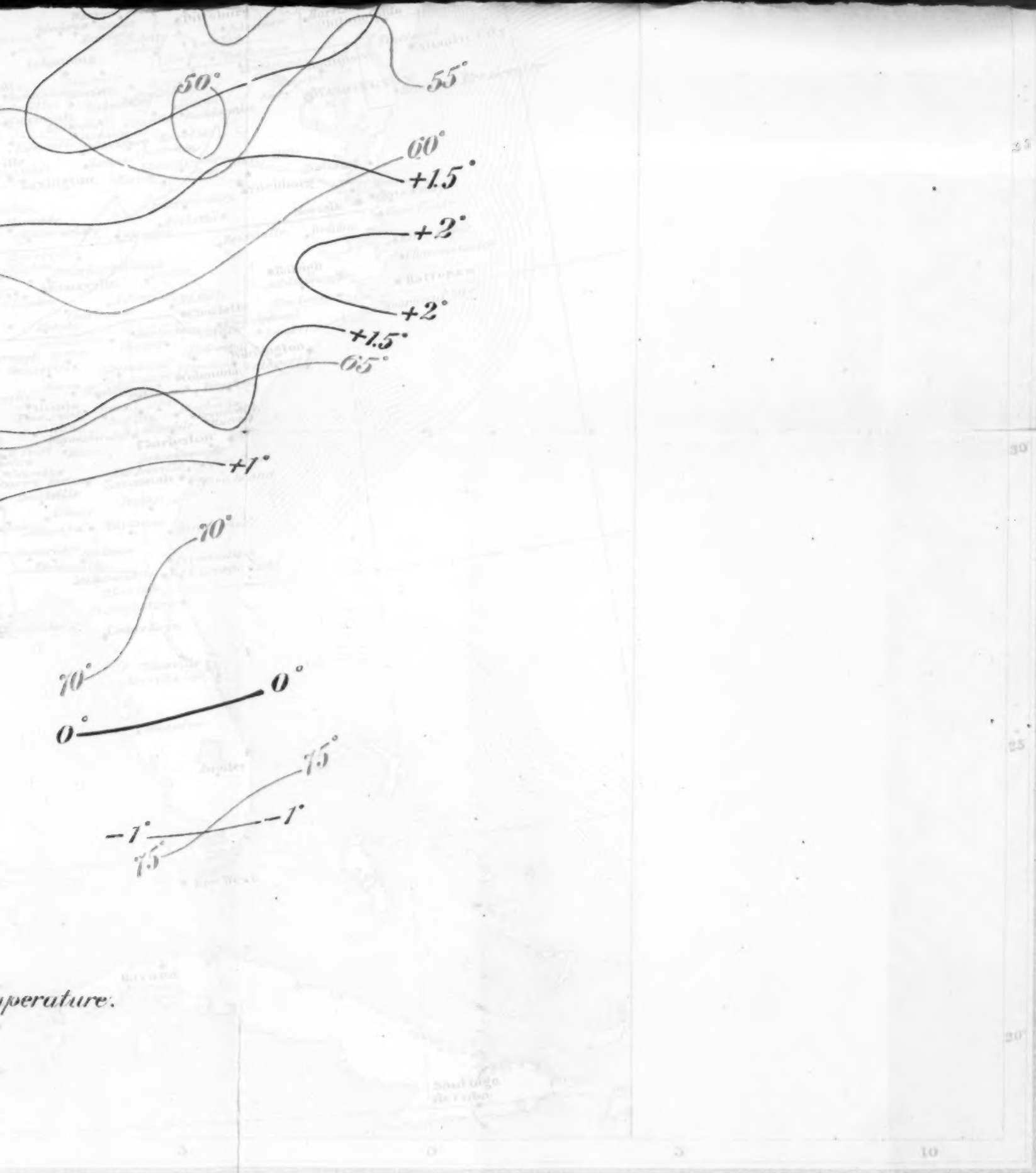
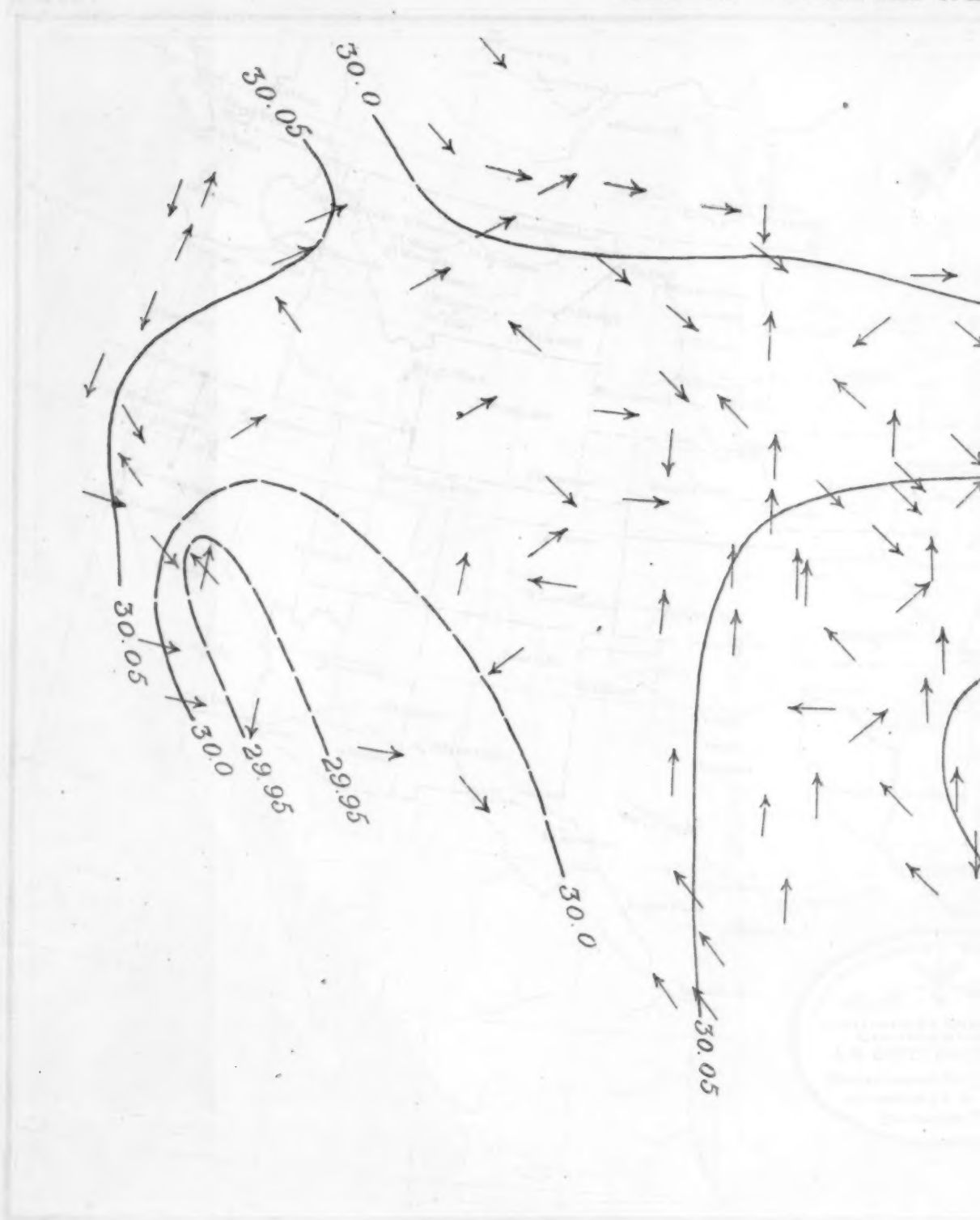


Chart II. Isobars and Wind



and Winds, 1890.

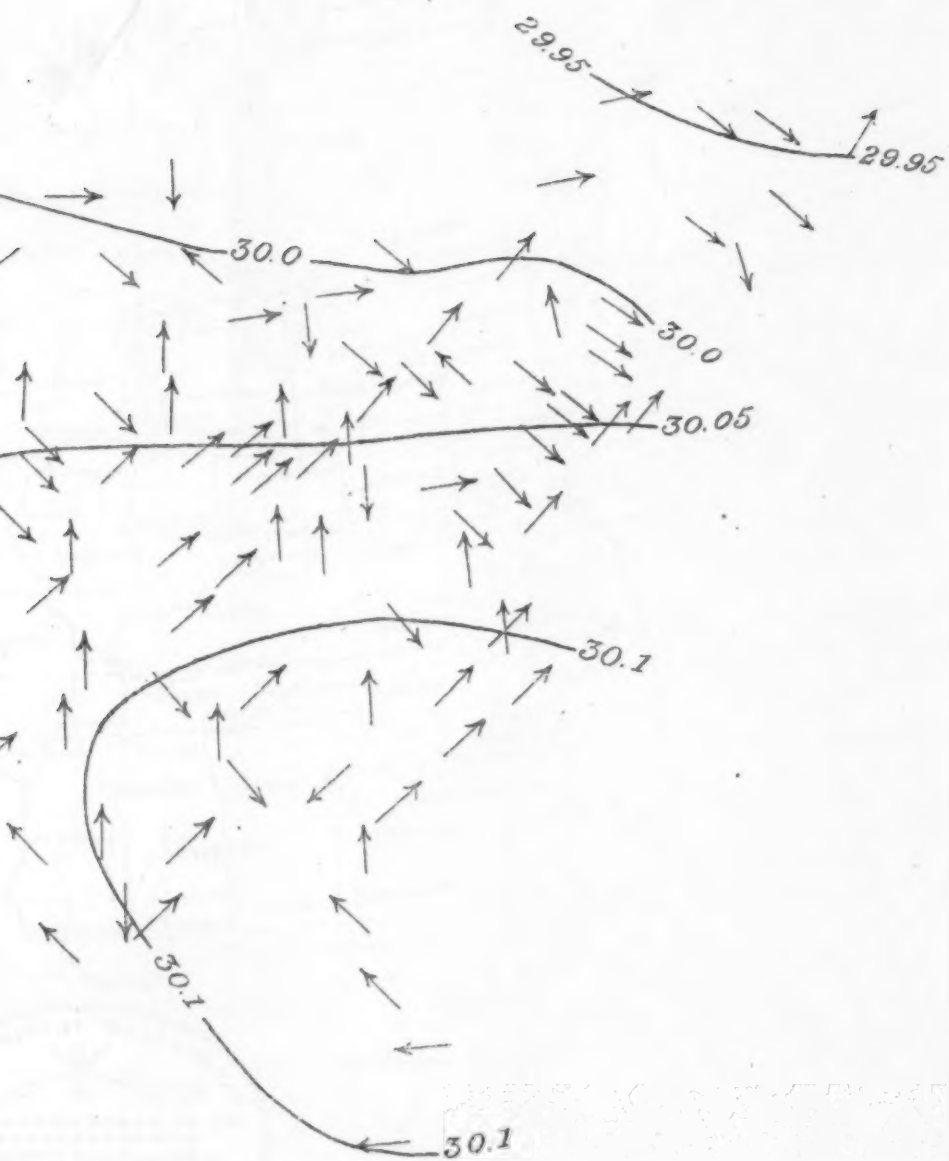
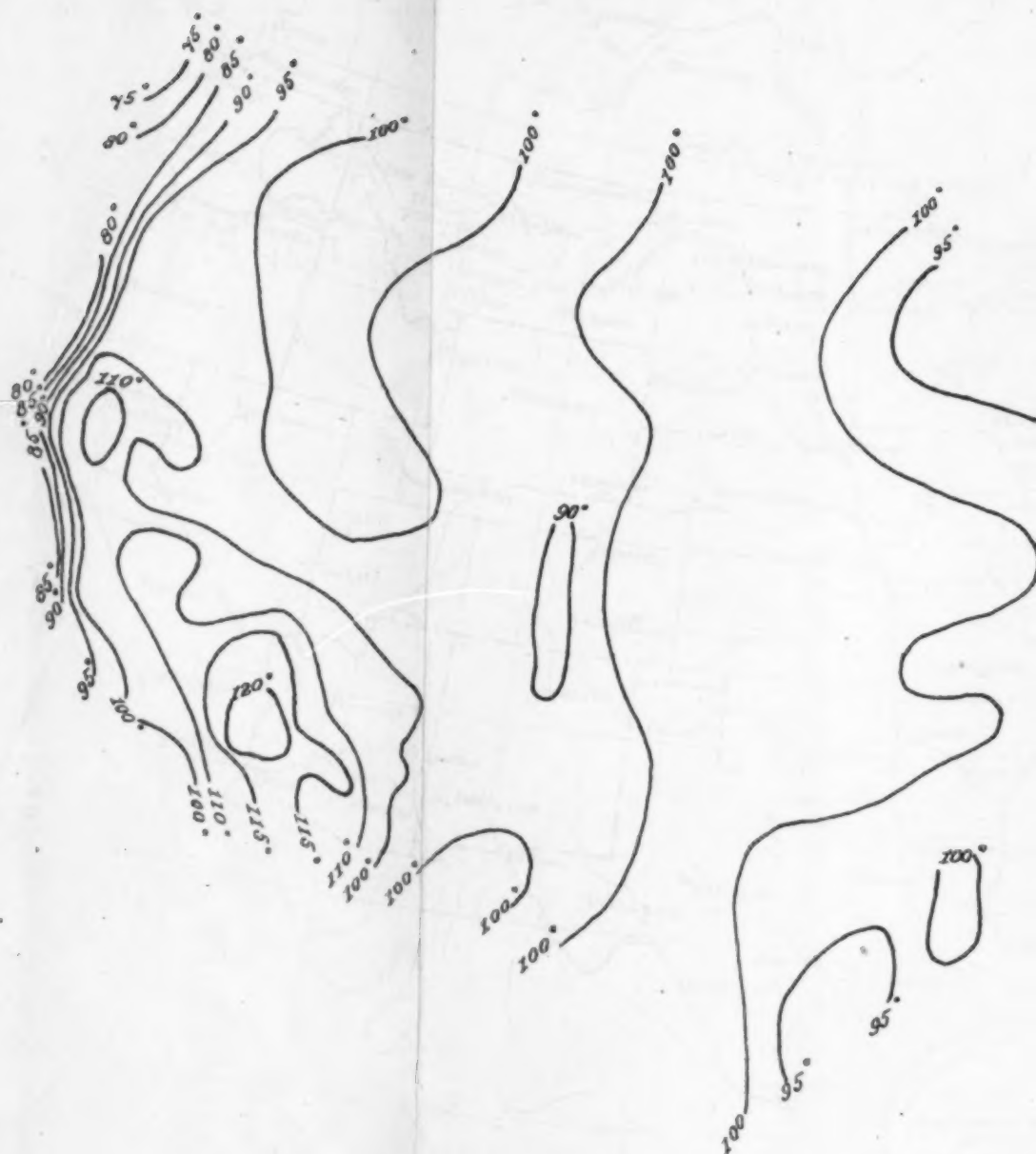


Chart III. Maximum Tem



um Temperature, 1890.

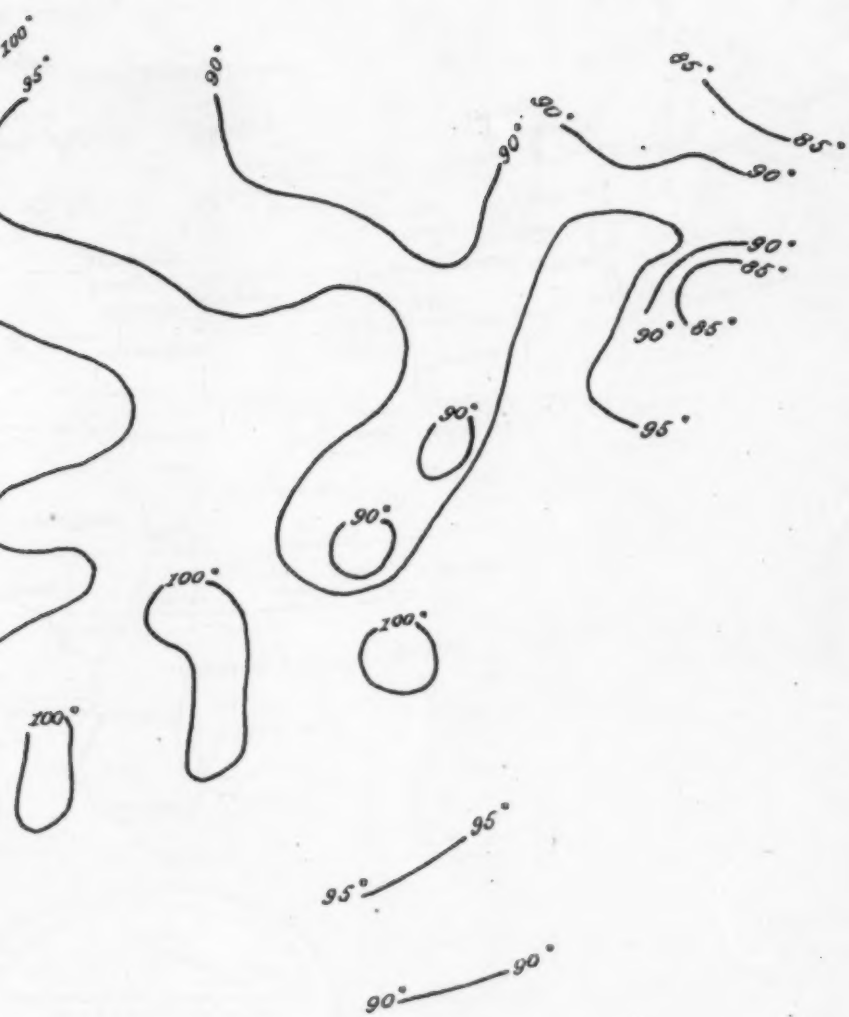
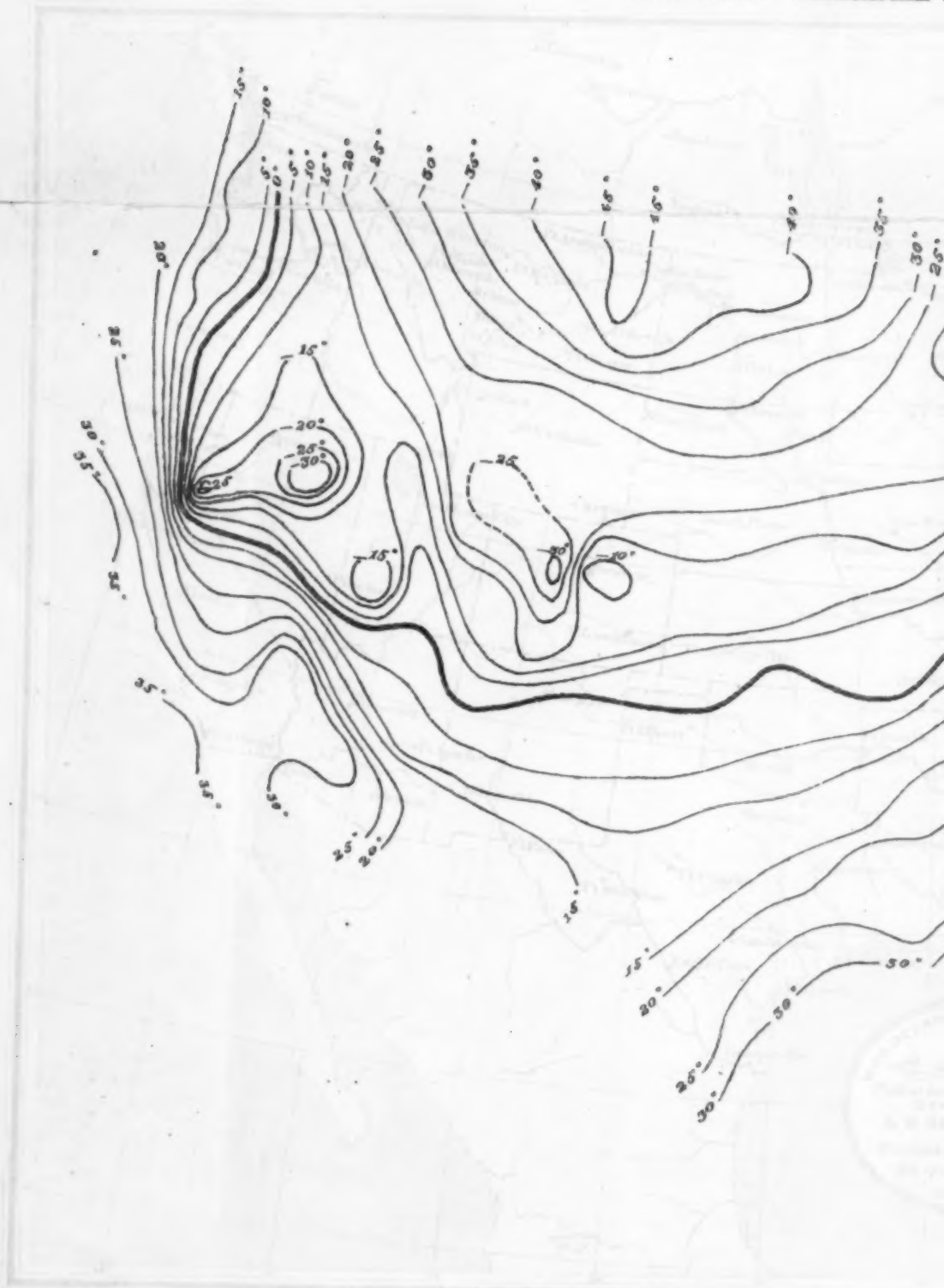


Chart IV. Minimum



Minimum Temperature, 1890.

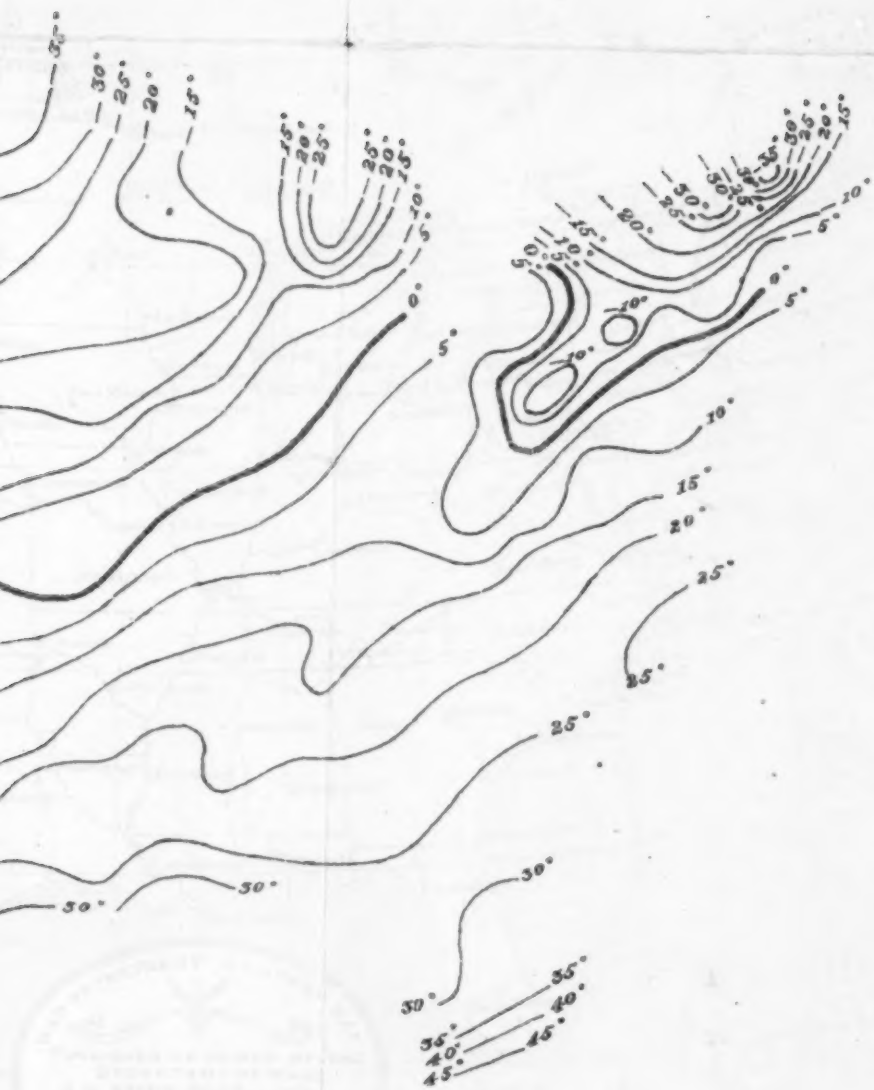
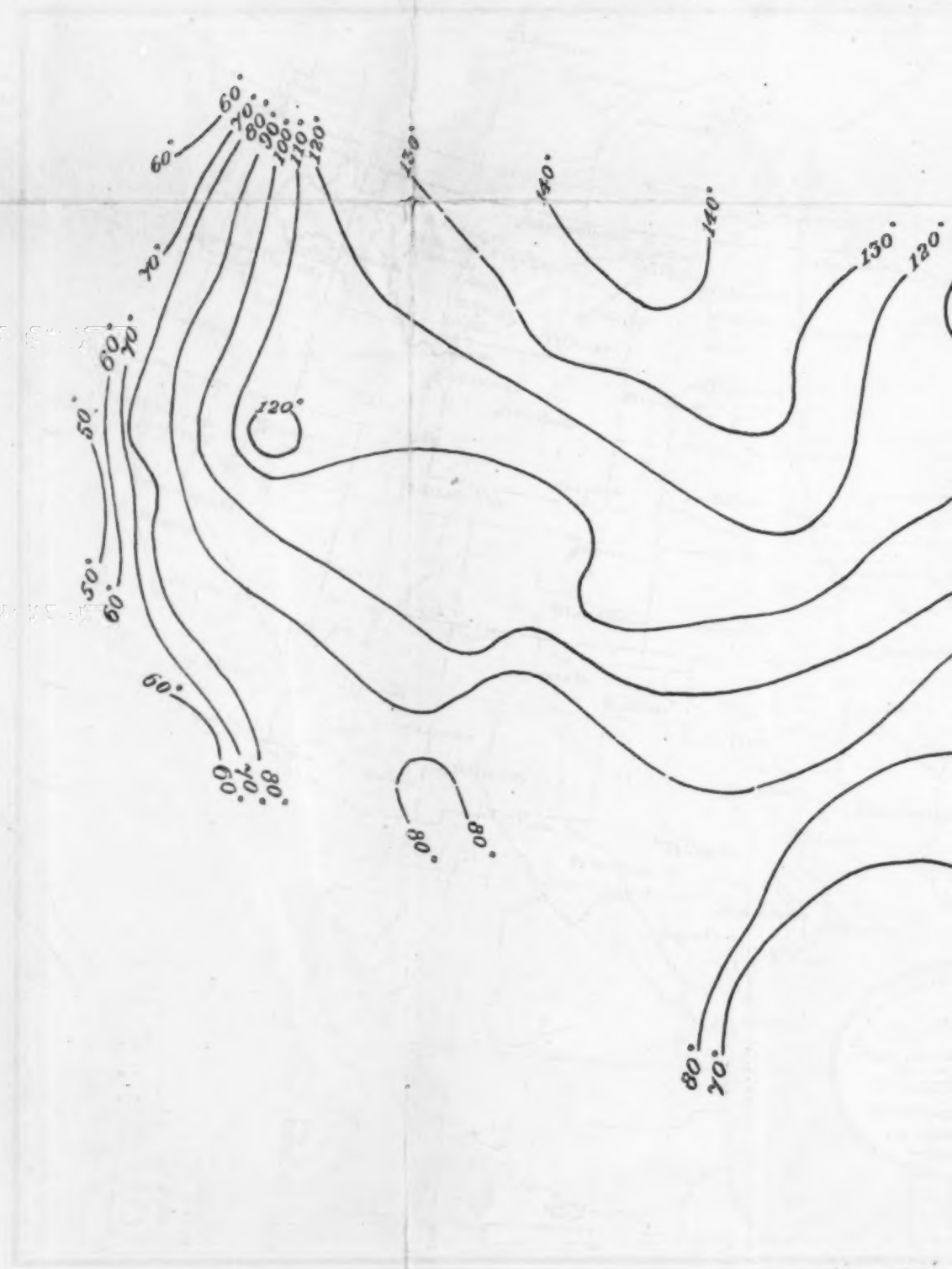
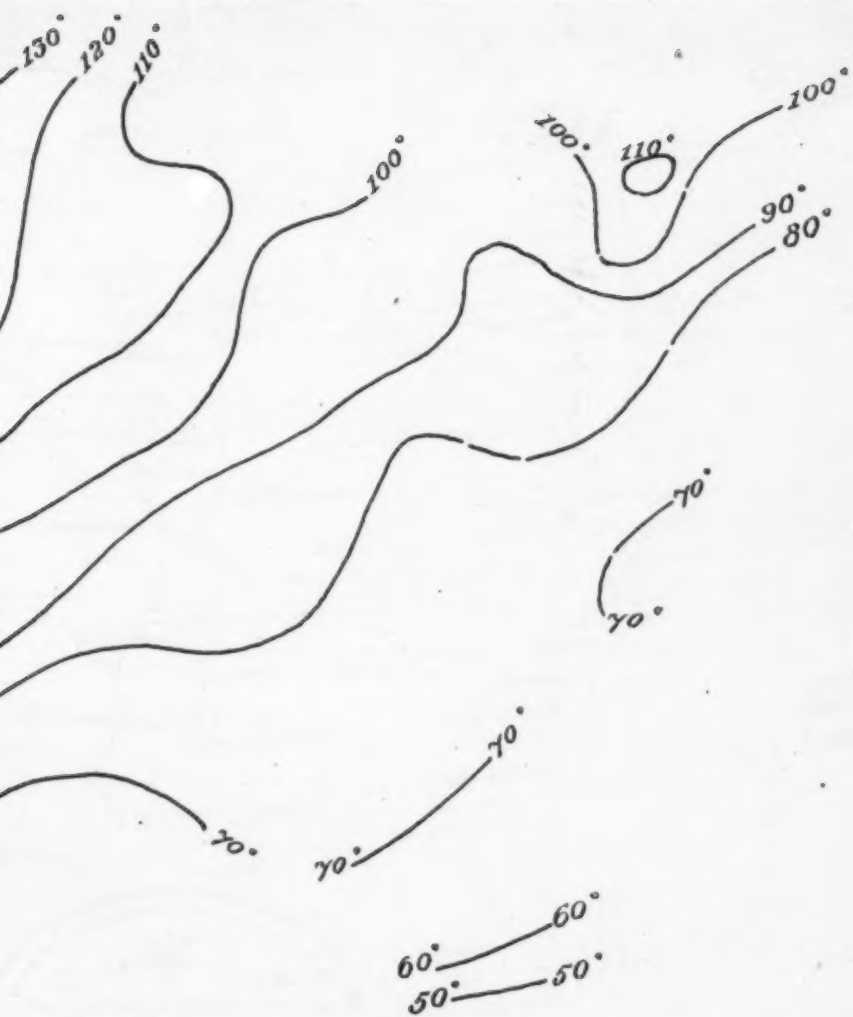


Chart V. Temperature R



ature Ranges, 1890.



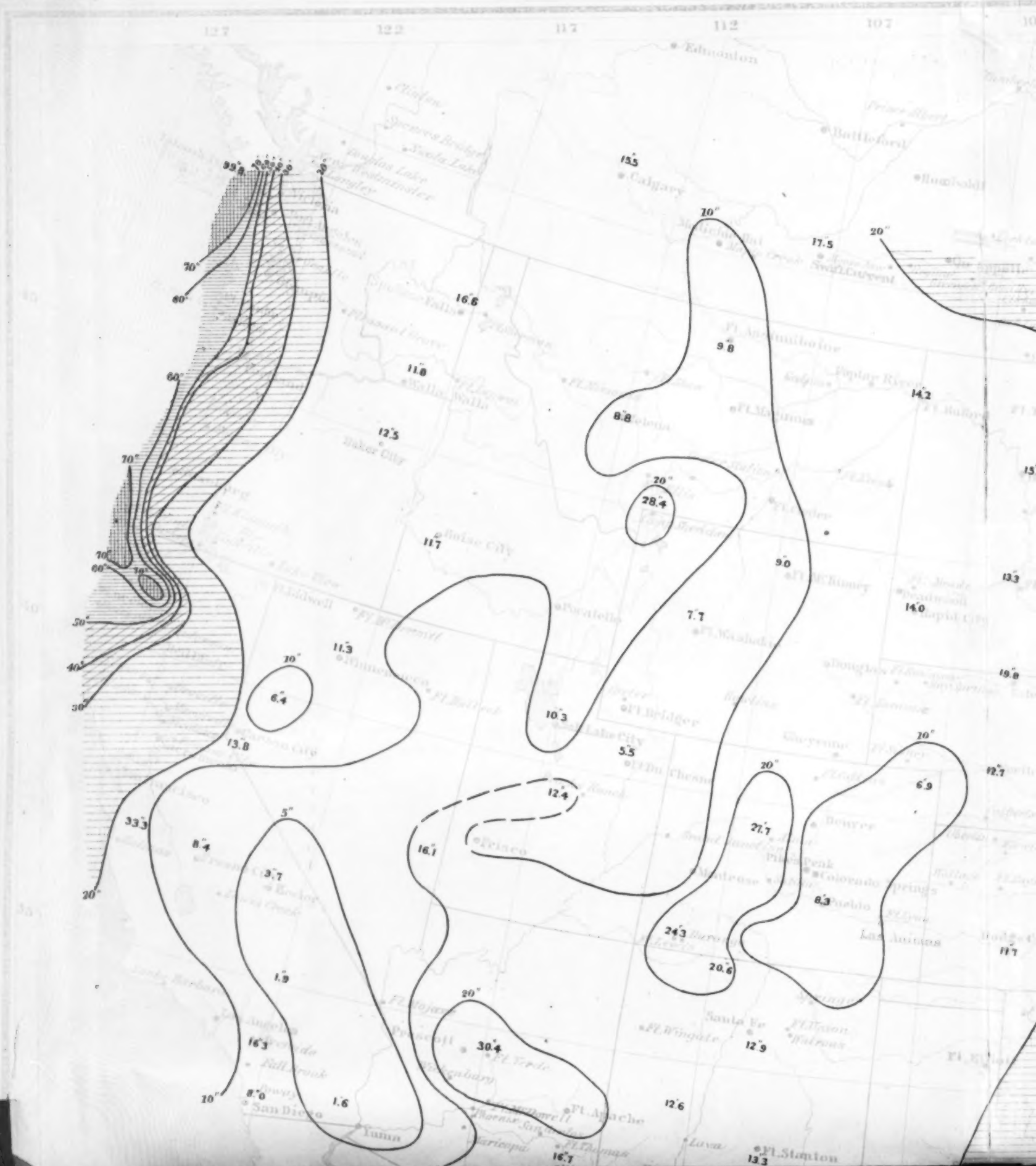


Chart VI, Annual Precipitation, 1890.

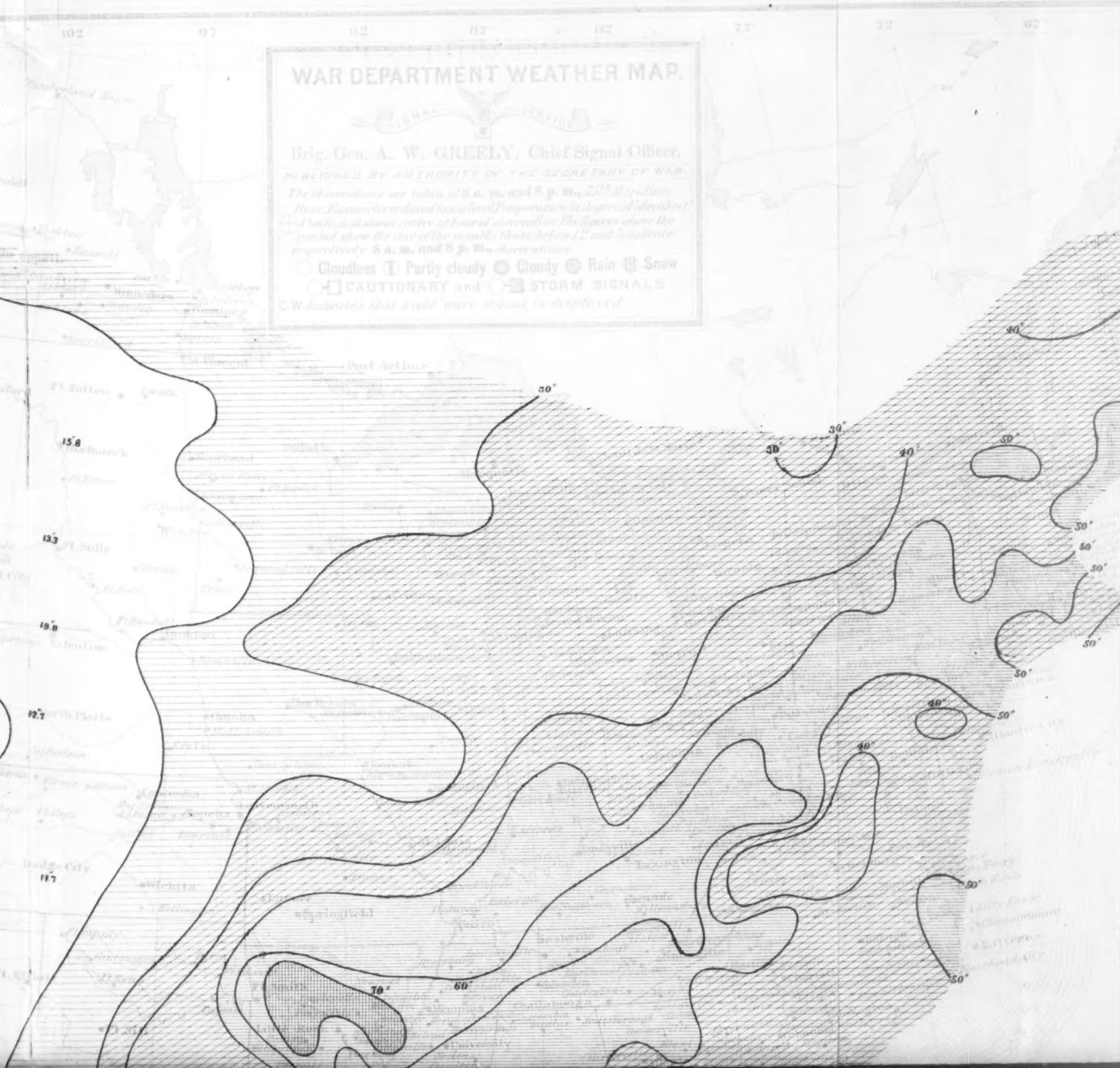
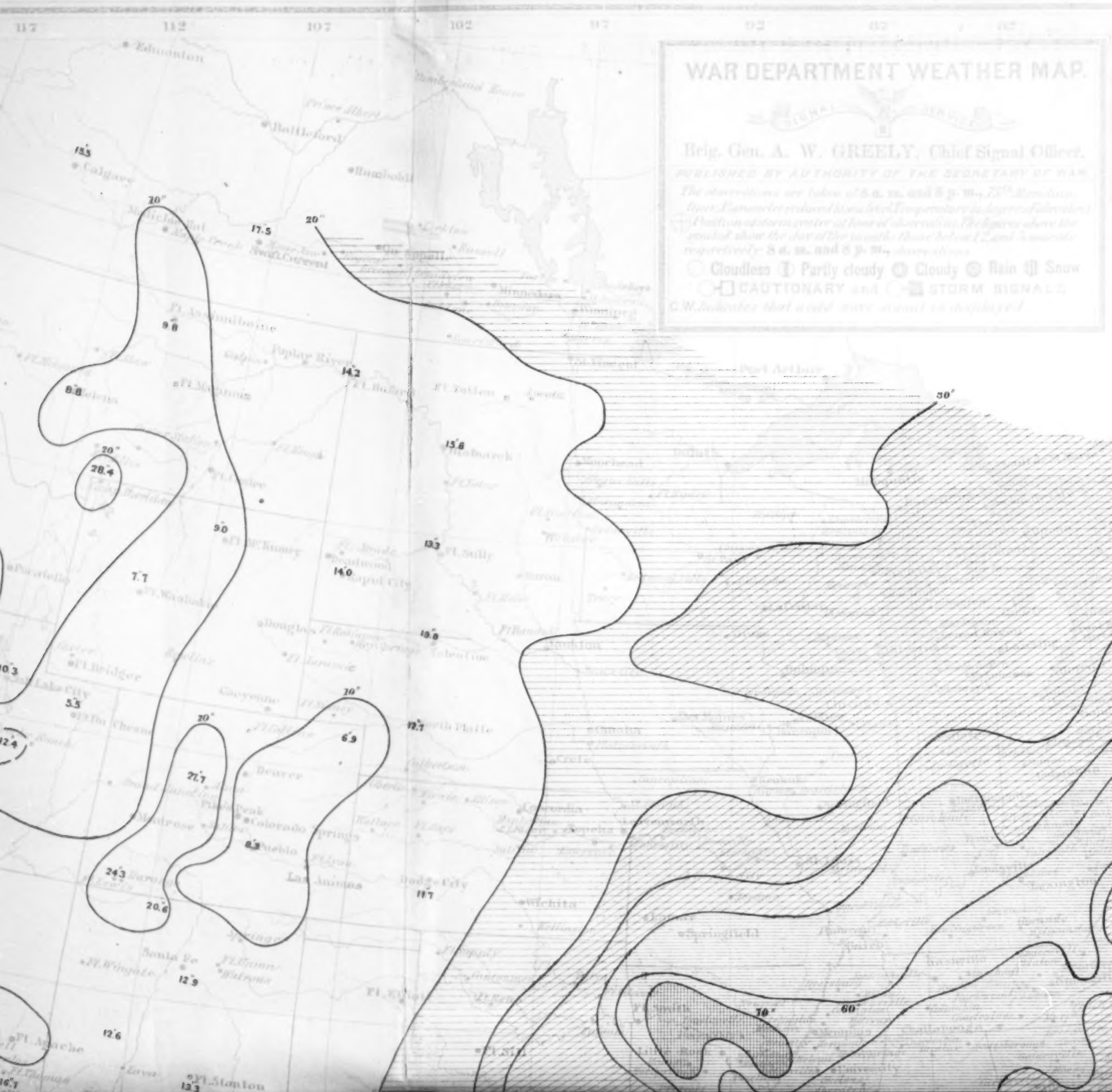
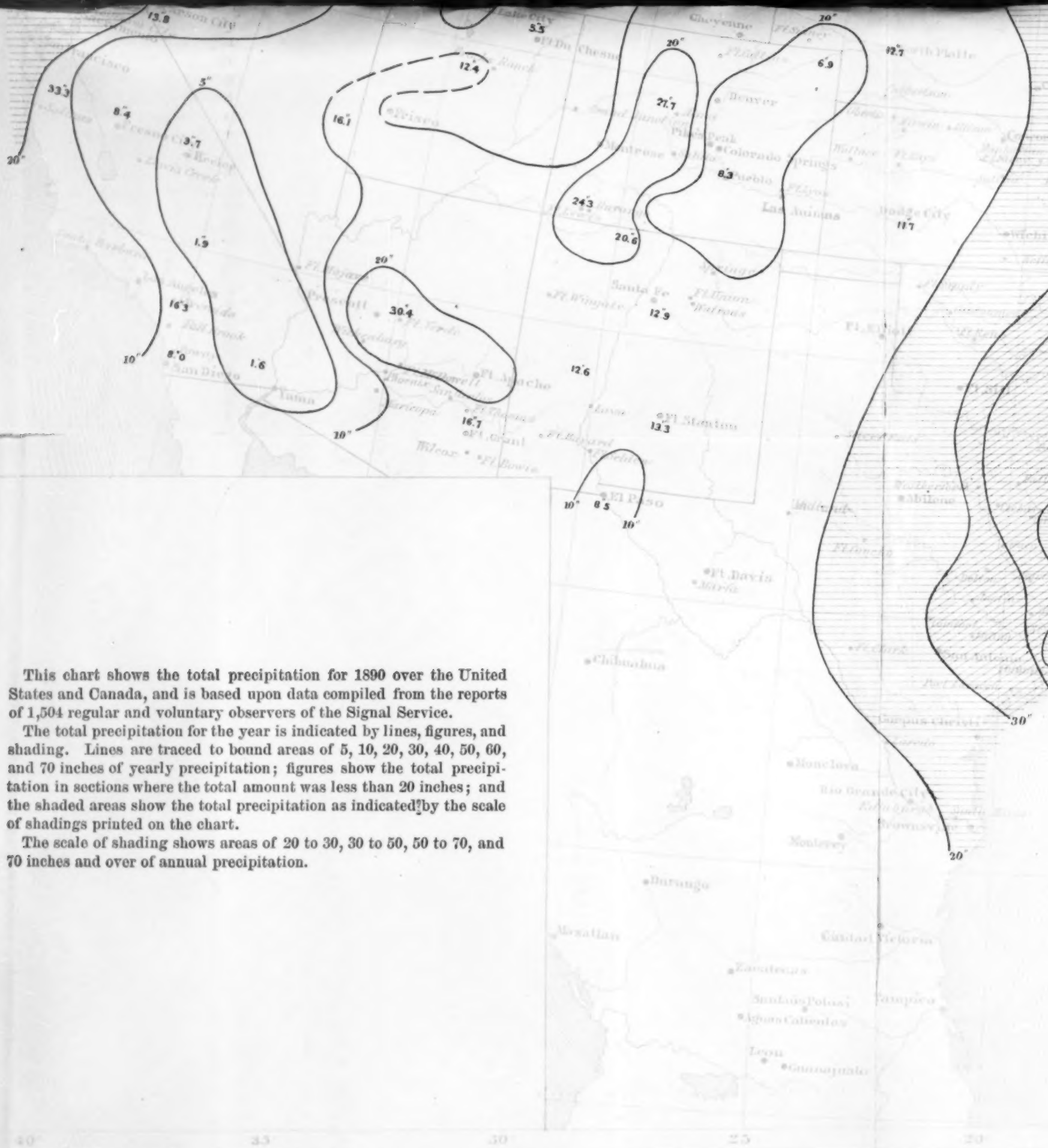


Chart VI, Annual Precipitation, 1890.







This chart shows the total precipitation for 1890 over the United States and Canada, and is based upon data compiled from the reports of 1,504 regular and voluntary observers of the Signal Service.

The total precipitation for the year is indicated by lines, figures, and shading. Lines are traced to bound areas of 5, 10, 20, 30, 40, 50, 60, and 70 inches of yearly precipitation; figures show the total precipitation in sections where the total amount was less than 20 inches; and the shaded areas show the total precipitation as indicated by the scale of shadings printed on the chart.

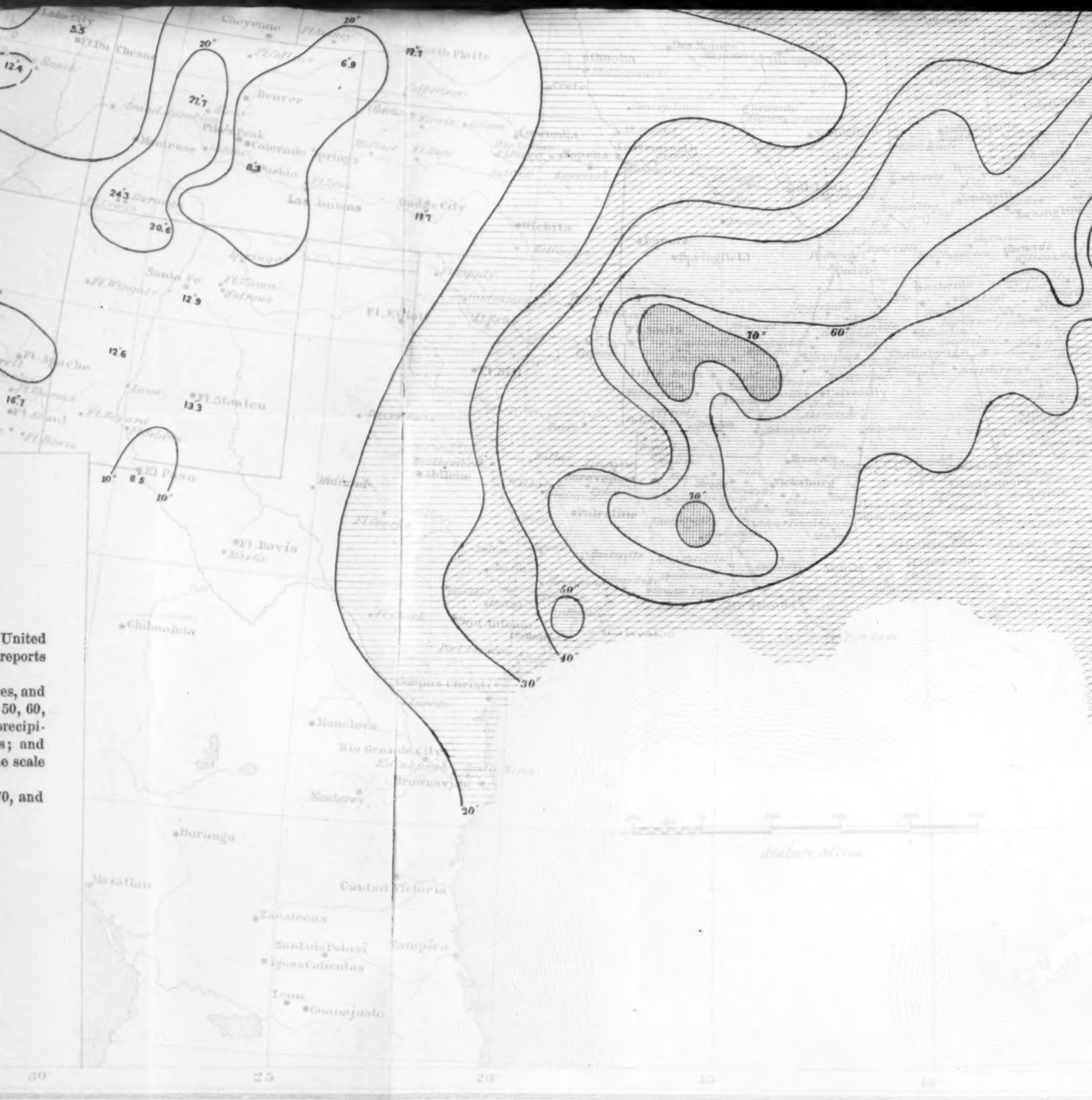
The scale of shading shows areas of 20 to 30, 30 to 50, 50 to 70, and 70 inches and over of annual precipitation.



Scale of Shades.






	Below 20 inches.
	20 to 30 "
	30 to 50 "
	50 to 70 "
	Over 70 "

United
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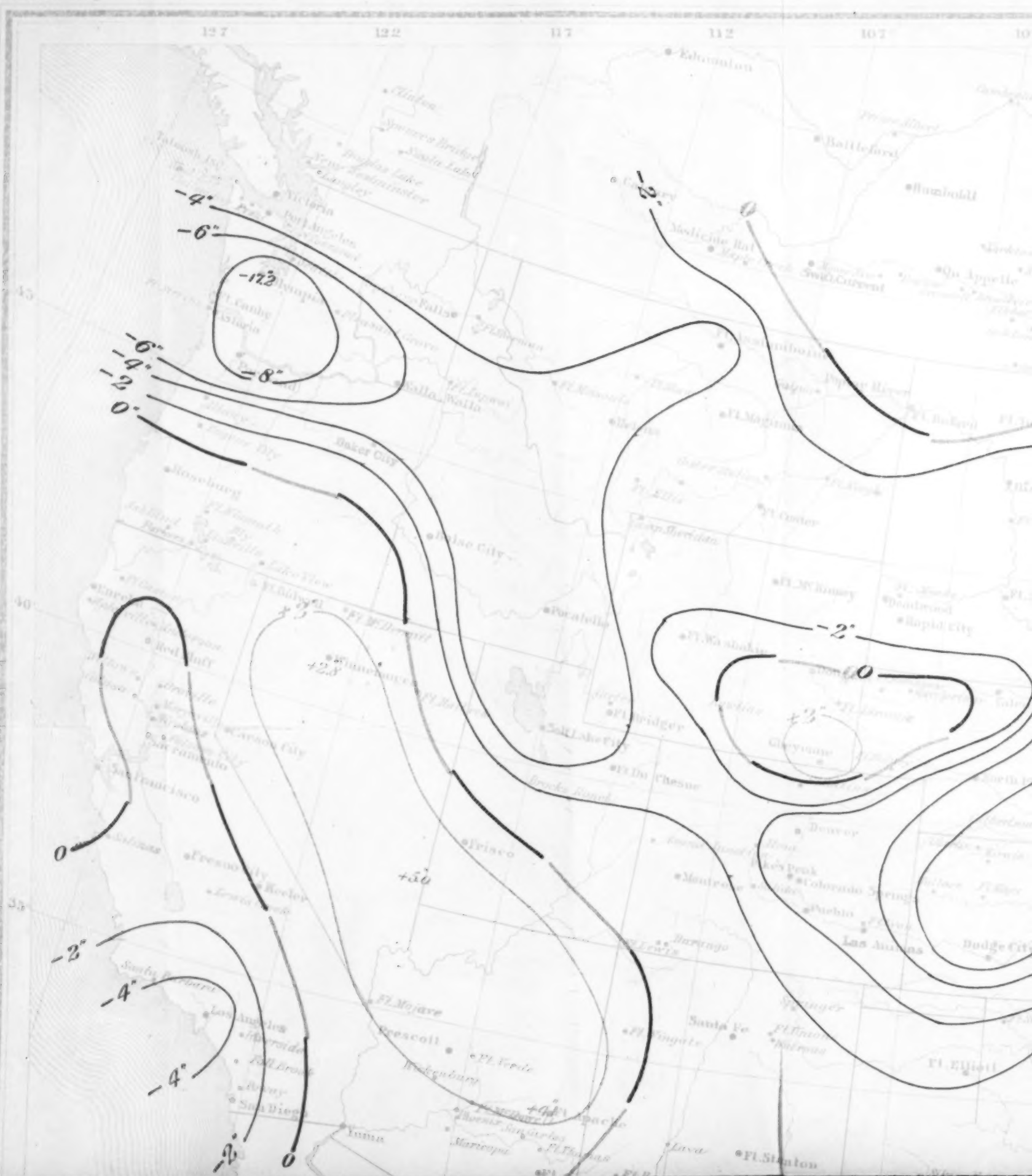




Scale of Shades.

	<i>Below 20 inches.</i>
	<i>20 to 30 "</i>
	<i>30 - 50 "</i>
	<i>50 - 70 "</i>
	<i>Over 70 "</i>





T VII. DEPARTURES FROM NORMAL PRECIPITATION, 1890.

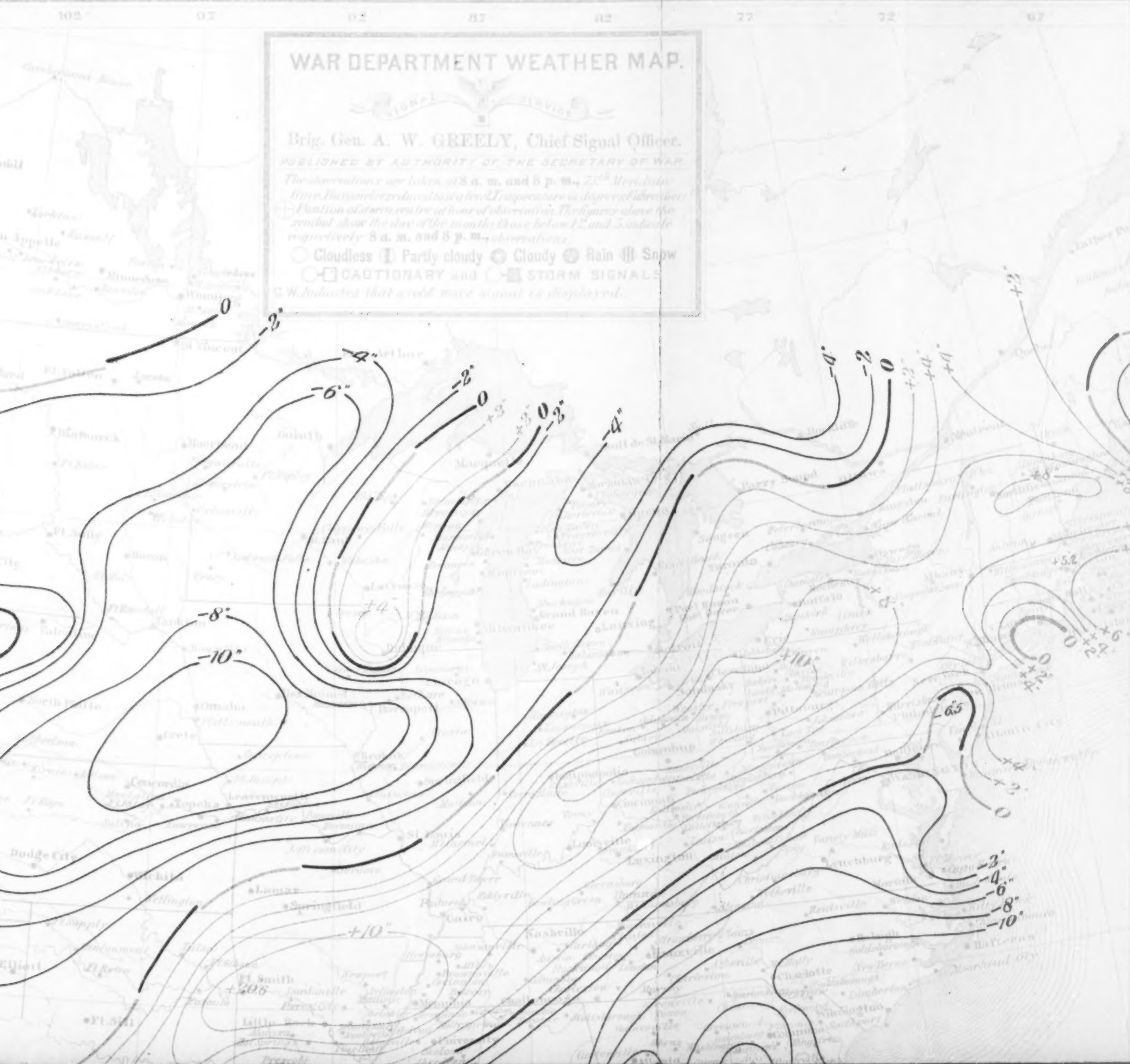
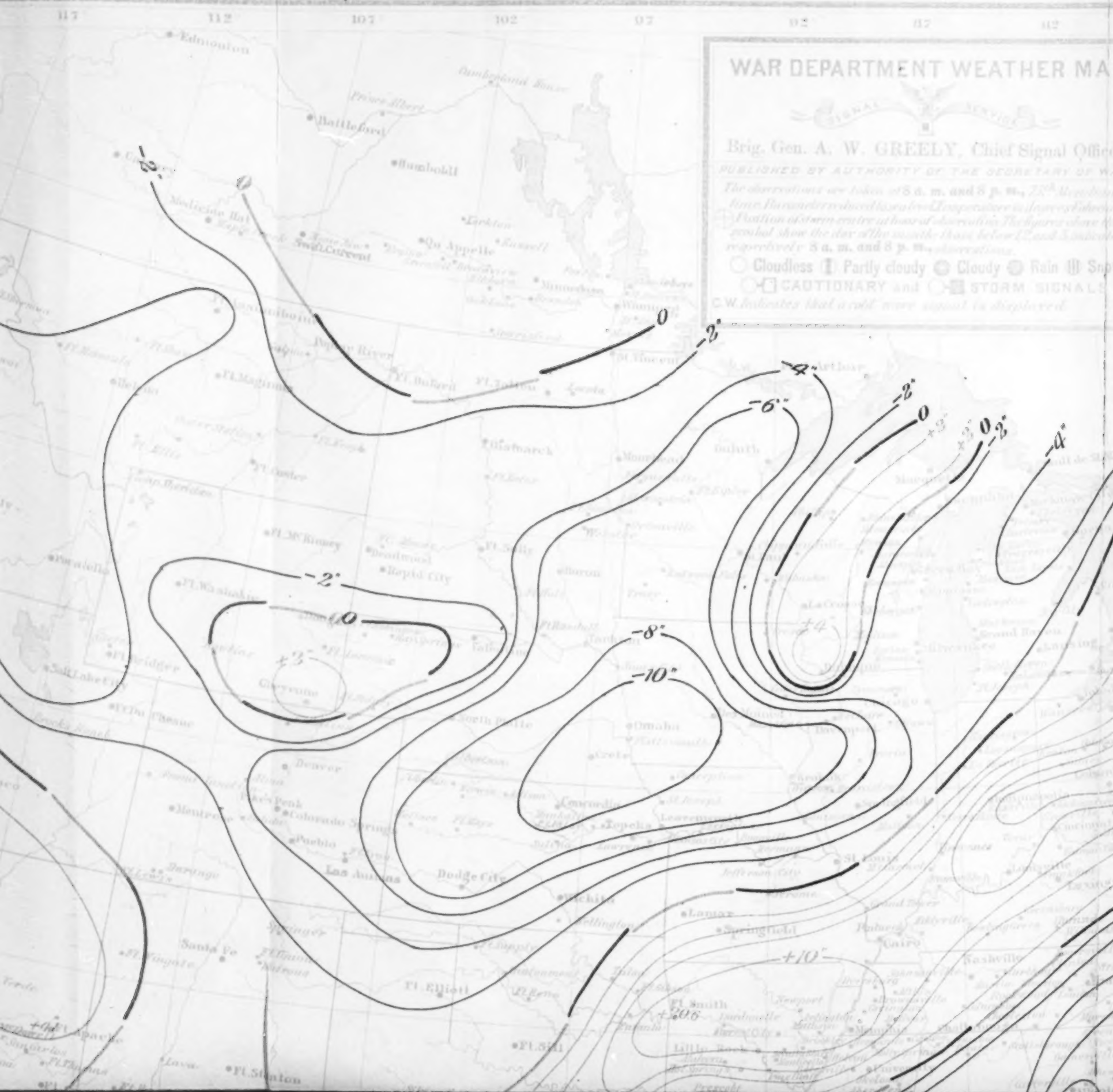
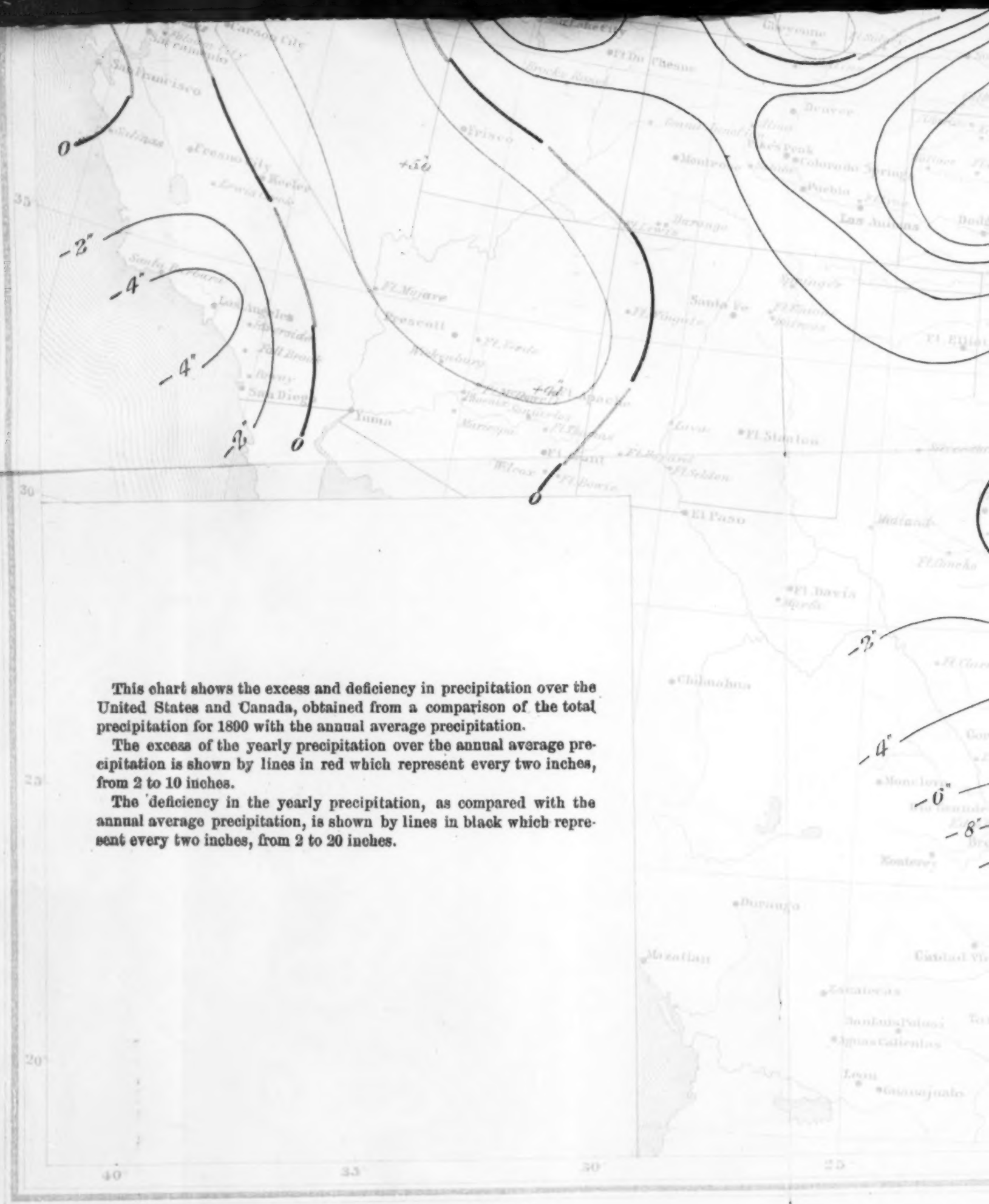


CHART VII. DEPARTURES FROM NORMAL PRECIPITAT



PITATION, 1890.



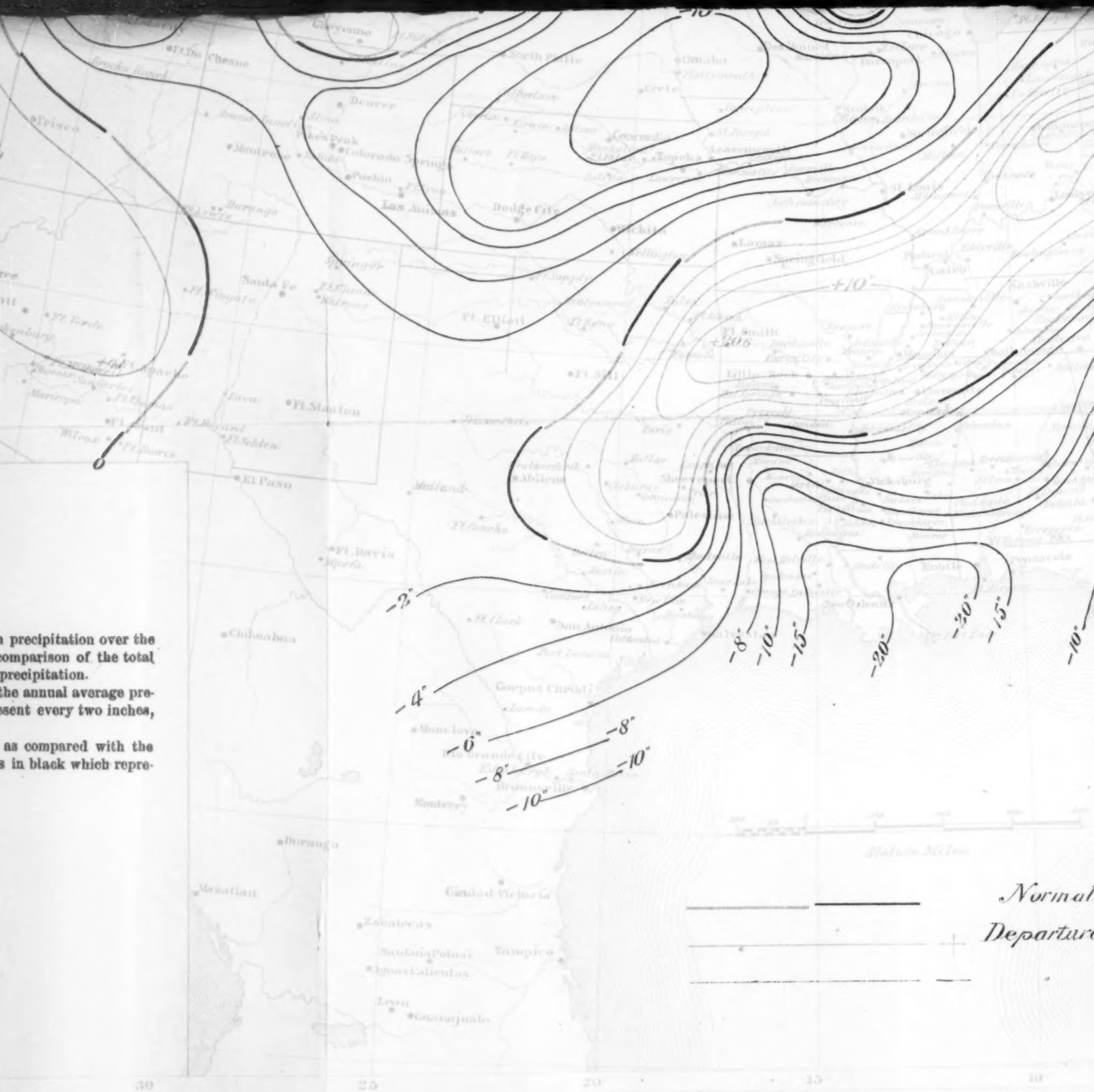


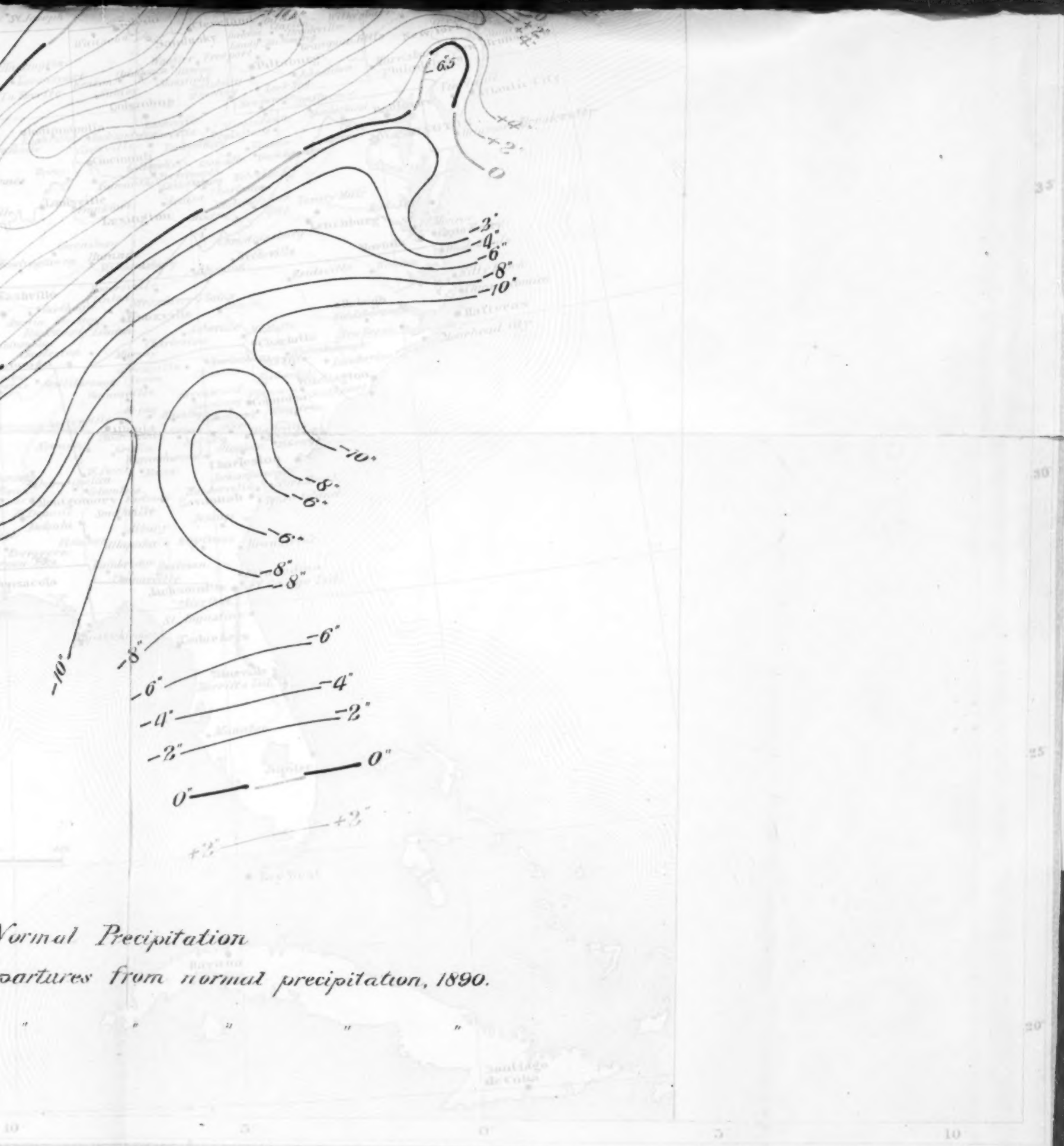
This chart shows the excess and deficiency in precipitation over the United States and Canada, obtained from a comparison of the total precipitation for 1890 with the annual average precipitation.

The excess of the yearly precipitation over the annual average precipitation is shown by lines in red which represent every two inches, from 2 to 10 inches.

The deficiency in the yearly precipitation, as compared with the annual average precipitation, is shown by lines in black which represent every two inches, from 2 to 20 inches.

precipitation over the
 comparison of the total
 precipitation.
 the annual average pre-
 cipitation every two inches,
 as compared with the
 is in black which repre-







UNITED STATES OF AMERICA:
WAR DEPARTMENT.

ANNUAL SUMMARY FOR 1890.

SUPPLEMENT TO

MONTHLY WEATHER REVIEW

FOR DECEMBER, 1890.

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deficiencies in precipitation.		cipitation; VII. Departures from annual precipitation.	

From

PREPARED UNDER THE DIRECTION OF
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CHIEF SIGNAL OFFICER OF THE ARMY.

BY H. H. C. DUNWOODY,
MAJOR, SIGNAL CORPS.

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